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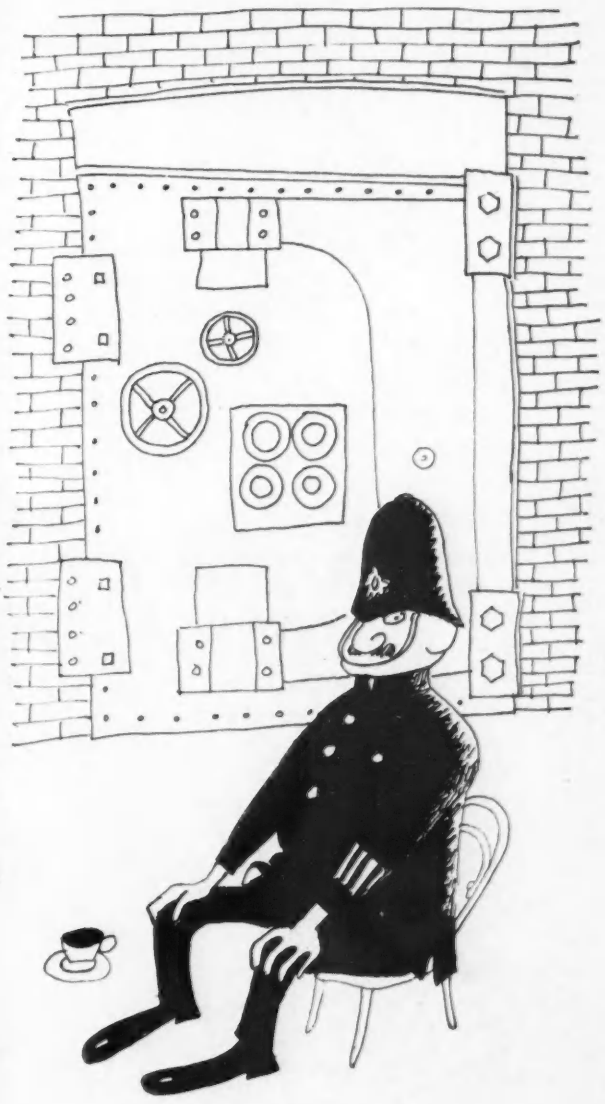

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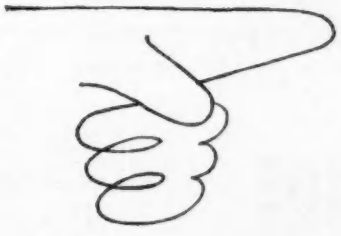

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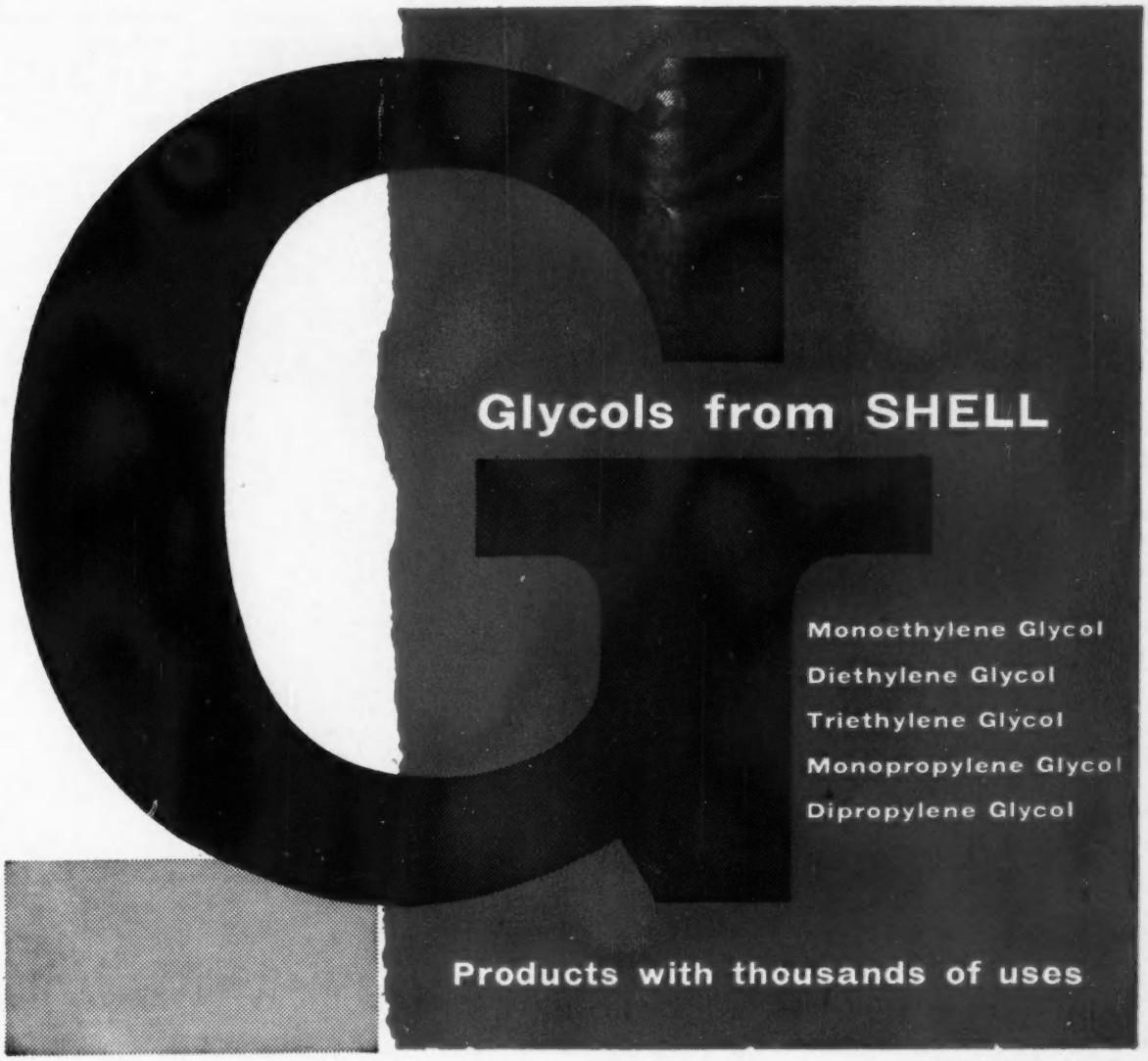

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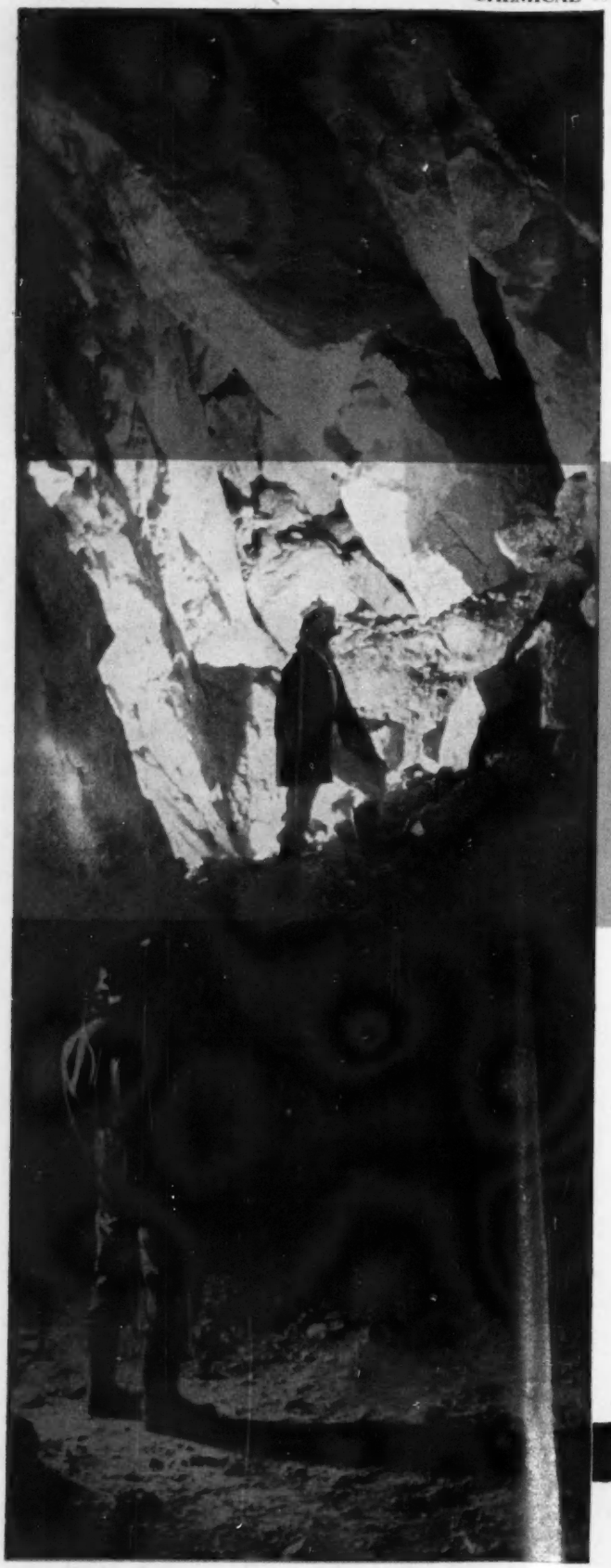

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CHEMICAL AGE

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TRADE WITH EUROPE

THE Government seems to be speaking with two voices on the need for a merging of the 'Outer Seven' and the 'Six.' Last week, Mr. Reginald Maudling, President of the Board of Trade, told the Institute of Directors that the division of Europe into two trading blocs was a 'tragedy.' A few days later, Mr. R. A. Butler, Home Secretary, said that Common Market policy was unsuitable for British agriculture.

It has long been known that Mr. Maudling's views on free trade in Europe have been strongly backed in the Cabinet, notably by the Prime Minister and by Mr. Ian Macleod. But it is less than fair to British industry that two conflicting views should emanate from the Government.

There can be no doubt that some sections of commerce and industry would be hurt by a merger of the trade blocs—and this may well explain the divergent views on the subject by Government Ministers. Equally, there can be no doubt that without such a merger Britain faces a bleak future. British industry cannot afford to do without the great and growing market of West Europe; a merger of the Economic European Community and the European Free Trade Association in some form or another is vital to British industry generally and to the continued expansion of our national economy.

As Sir William McFadzean, president of the Federation of British Industries, rightly said in London last week (see p. 762), trade is greatest between those countries which are the most highly industrialised.

Sir William also made timely reference to the now outworn cliché—favoured by many firms whose export performance is not all that it should be—that an export market cannot be maintained without a sound home market. Today the reverse is the truth. Without a healthy and expanding export trade, Britain cannot pay for her mounting imports. If, through an inability to make the most of opportunities overseas, Britain has to cut imports, then production generally will suffer with a consequent loss of both home and exports sales and a general lowering of our standard of living.

Many firms, chemical producers included, will doubtless say they are weary of being exhorted to export more; that they have had enough of export drives. But the need to capture more trade overseas is the greatest problem facing British industry today.

That leaders of the chemical industry clearly recognise their responsibilities in this matter was made clear in our special overseas edition last week. The Government, however, cannot expect industry to respond to every export plea that is made if it cannot devise a clearly defined and vital policy on exports and present it with unanimity. A great deal of harm will be done if official policy is tempered to the audience. Such a course of expediency is bound to fail for in the long run it will antagonise all sections of the community and confuse our overseas partners.

There was a marked absence of any reference to Europe's trade problems in the Queen's speech on Tuesday. It is to be hoped that Mr. Macmillan will remedy this when next Monday he speaks at the dinner to be held in connection with the political and economic conference that is being held by the U.K. Council of the Europe Movement on the European Free Trade Association.

DISTILLATES

★ ANOTHER bumper year reported by a major chemical company. This time Fisons chalk up record sales and profits. After reading the annual report and listening to Sir Clavering Fison, chairman, at a Press conference in London on Tuesday, it is obvious to me that this Group is bursting at the seams with ideas and expansion projects.

The board expects a major ammonia project soon and is currently negotiating three large-scale chemical contracts with the Soviet Union. At least one of them is expected to materialise. New products are under development by Bengers, but I could obtain no clue as to what these were likely to be—beyond the fact that they do not include a contraceptive pill!

Unprecedented and unpredicted fertiliser sales in 1959-60 lifted profits to record levels. Profits are expected to return to a normal growth in the current year, rising to an exceptional level by 1962 and reaching £5 million by 1965, not taking into account successful acquisitions (1959-60 net profit was just over £2 million). Chemical profits, before tax and holding company expenses, were this year about £1 million gross, 20% up on last year; this side of the business is expected to grow rapidly. Chemicals represented about one-quarter of fertiliser sales, and productivity in the Chemical Division is still well below the fertiliser level. About half of the total research bill goes on chemicals.

★ CLAIMED to be the most comprehensive rustproofing system ever used in the motor industry, the new system used by the Chrysler Corporation in Detroit for their 1960 models provides electronically controlled cleaning and drying, heating and cooling, rinsing, priming and painting. It is claimed to give full protection to every part of the car body. Each body is subjected to nine different temperature changes, three metal cleaning baths, seven anti-corrosion dips, seven spraying operations and seven external paint finishing operations. The anti-corrosion phase alone takes 1 hr. 45 min.

Motorists, of course, are interested in the relationship between the corrosion resistance and decorative effect of finishes, and particularly with the problem of keeping chrome plate free from rust. An opportunity to investigate these matters will occur at the four-day Corrosion and Metal Finishing exhibition which is to be opened by Sir Alexander Fleck at Olympia, London, on 29 November. The organisers think the Exhibition is now probably the world's largest display of metal finishing products and services.

Just to illustrate that metal finishing is not necessarily a matter of purely technical interest, I show here one of the many amusing cartoons by the artist 'Jon' from the book "Two Types", published by Ernest Benn Ltd., which will be of particular interest to any ex-Eighth Army men among my readers.

★ A GENTLE chiding reaches me from Chemische Werke Hüls, following my comment on their new colour film 'Between Formula and Form' (this page, 15 October). The commentator to the film—who deserves the rebuke—said that 'polythene' had made vast strides since its first commercial development in 1953.

The Hüls film in fact referred to "low-pressure polyethylene and not to the high-pressure polyethylene of I.C.I., whose research work we acknowledge". It seems that the commentator forgot the all-important words 'low-pressure'.

★ FOLLOWING our recent brief note on the glass-fibre stack to be built for B.I.P. Chemicals by Truswell and Son Ltd. as part of a contract for a new boilerhouse plant and coal-firing equipment, I am interested to learn that this will save about 697 tons in weight compared with a brick chimney of similar size. It will be the largest stack of its type in the country, measuring 5 ft. 6 in. in diameter and 150 ft. high.

The potential for such chimneys appears considerable, but performance data will have to await completion of field trials. It is hoped, however, that apart from the weight-saving (the stack will weigh under three tons), it will resist acidic gases from the boilers, particularly when those gases are below dew-point.

The project should be under working conditions at the end of next year. The idea to use such a stack came from Mr. Michael J. How, a director of Truswells.

★ CONVERSION of salt water to fresh for as little as half a crown per thousand gallons is the hope of Dr. Alexander Zarchin, a 65-year-old Russian-born Israeli settler. He is not alone in this hope, for he has the backing of the Israeli Government and engineers of the American irrigation company, Fairbanks-Morse and Co., for his pilot plant experiments, now being carried out. The Fairbanks-Morse people are confident that he has achieved a long-sought 'break-through' in this field.

The first operational plant is due to start working next year with a capacity to produce 500,000 gallons of drinking water a day—enough for half the 7,000 population of the Port of Eilat, at the southern tip of the Negev and the head of the Gulf of Aqaba, to which town the water will be piped. A sister plant is due for completion in 1962, when it will begin the larger task of irrigating neighbouring arid lands.

Zarchin's process is described by F-M officials as 'dramatically simple in operation.' Much of it is still hush-hush, but basically it consists of pumping water to a vacuum freezing unit, which produces an 'ice sandwich' of several layers of brine and several of fresh water.

★ LOOKING at the foregoing and other new scientific ideas in Israel, one might be led to think that Israeli scientists have "water on the brain"—purely in a manner of speaking, of course. For I learned recently that Dr. H. Tabor, of Israel's National Physical Laboratory, had developed a simple method of exploiting solar energy as a source of power, using a pool of water. Salts dissolved in the water confound the natural convection process which normally brings the warmer water to the top, and keeps the heat at the bottom instead of its being dissipated by evaporation. So, as the sun shines on, the water at lower level gets hotter and hotter.

Juggling about with the optimum size of pool, the cost of construction and probable heat conversion efficiency, it is calculated that a pool with a surface area of 1 sq. km. could produce electricity for a cost of about £80/kW, which compares favourably with estimated nuclear power costs.

Alembic

"Chromium-plated brew can—must be Allied Commission, old man!"

Project News

I.C.I. Step Up Phenol, Acetone and Other Tees Capacities

ACETONE, phenol and many other Tees-side plants of I.C.I. Heavy Organic Chemicals Division are being modified to obtain substantially greater outputs with little additional capital spending. Plants have already been working efficiently to full capacity and the present programme of modifications is aimed at raising productivity still further.

Some of the capacity expansions have already been announced, including high-purity ethylene from the three Wilton olefin plants, capacity for which is being stepped-up from 120,000 tons/year to about 140,000 tons/year.

As stated in our special chemical projects survey (C.A., 24 September, p. 497), there will be corresponding increases of the other products of these units, including propylene, butadiene and butenes. Thus larger feedstock supplies will be available for Wilton and Billingham plants of H.O.C. and other I.C.I. Divisions which rely on the olefin plants.

Not previously announced is the raising of acetone capacity from about 28,000 tons/year to 36,000 tons/year by mid-1961. H.O.C. Division produce acetone at Billingham from propylene piped under the Tees from Wilton. Propylene is hydrated by an I.C.I. process to give the azeotrope of isopropanol and water, most of this azeotrope is then converted to acetone. I.C.I. captive use for acetone is for the production of methyl methacrylate and throughout industry as a general solvent. Propylene is also converted to butanols at Billingham in part of the carbonylation plants, which are also being extended to keep up with demand for these and higher alcohols, both in U.K. and in fast-growing export markets. Output of the carbonylation units varies with the products being made, but last autumn was some 60,000 tons/year.

Following a considerable expansion in Billingham phenol production completed earlier this year, raising output from 15,000 tons to 20,000 tons/year—new equipment is currently being installed in the phenol by-products plant complex to raise the production of Topane and para-phenylphenol from about 650 tons/year to 1,000 tons/year by end-1961. Topane is the I.C.I. brand of ortho-phenylphenol and an efficient disinfectant and preservative. Para-phenylphenol is an intermediate in surface coatings and resins production.

The two Wilton para-xylene plants are being modified to give a further large rise in capacity. Para-xylene is one of the two major raw materials for Terylene manufacture and is also exported to several countries for polyester fibre production.

Rapid progress is also being made with the H.O.C. Division's new plants at Severnside for 35,000 tons/year of ethylene oxide, ethylene glycol and associated products. Ethylene oxide is to be produced by direct air oxidation of ethylene (Scientific Design process), the ethylene to be piped from Esso Petroleum at Fawley.

Monsanto Polystyrene Plant on Stream

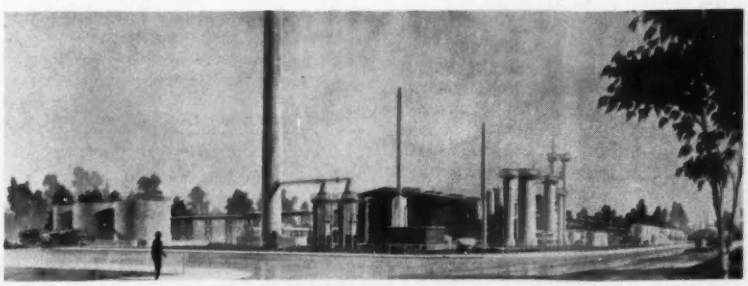
● NEW plant producing Montopore expandable polystyrene beads came into production on 1 November at the Newport, Mon., factory of Monsanto Chemicals Ltd. Additional units will go on stream in 1961.

One of the major uses of Montopore is the insulation of factory and domestic buildings. For price reductions see Trade Notes.

Four Big Overseas Contracts for Humglas

● THE award to the company of four major international contracts has been announced by **Humphreys and Glasgow** Ltd., London, but the company declines to give any particulars. One contract is for the design of a nuclear grade carbon dioxide plant in Western Europe, another, worth "several million pounds", is for the design and construction of a chemical plant in India. In Central America, Humphreys and Glasgow will be working on a new tetra-ethyl lead plant where anti-knock compounds will be produced. From the city of Melbourne, the company has received an £A1 million order.

The chairman of the company, Mr. A. Congreve, left London on 2 November on a world tour which will include visits to India and Australia for discussions on the projects there. He will also visit Singapore where Humglas have just completed a fourth catalytic oil cracking unit, and, at Osaka, Japan, will see preliminary work on another Humphreys and Glasgow contract—the biggest catalytic cracking plant of its kind in the world for making town's gas.



Artist's impression of I.C.I.'s new Severnside plants for ethylene oxide, ethylene glycol, etc., as they will appear by the end of 1961

Marchon's Sulphamic Acid Project at Whitehaven

● CONSTRUCTION at the company's Whitehaven factory of a plant to manufacture sulphamic acid (amido sulphonic acid), with a capacity more than sufficient to meet the whole of the United Kingdom's known requirements, is announced by **Marchon Products Ltd.** The manufacture of ammonium sulphamate is also contemplated. Sales of both materials will be in the hands of Albright and Wilson (Mfg.) Ltd. Marchon Products and Albright and Wilson (Mfg.) are both members of the Albright and Wilson group of companies.

Marchon Products decline to reveal how far construction of the new plant has progressed, or to give any further details.

Polymer Plan Butyl Plants in U.K. and France

● A BUTYL rubber plant is planned in the U.K. by the **Polymer Corporation,** Sarnia, Ont., a Canadian crown agency. This project is in the study stage and a site has yet to be chosen. Further advanced are plans to set up a butyl plant in France. The Sarnia plant of Polymer Corporation is to be expanded with U.K. and French capital at an estimated cost of more than £14 million. The Sarnia programme will take two to three years to complete and will raise output to more than a total of 200,000 tons a year.

Shell Plan Liquid Gas Tanker Fleet

● PLANS are in hand by **Shell** for the conversion of some of their oil tankers into liquid gas carriers on the lines of *Methane Pioneer* to transport methane from Venezuela to the U.K. Specially designed new tankers may also be commissioned.

Air Products' Tonnage Oxygen Plant at Fawley

● A NEW bulk oxygen/nitrogen plant has just been brought on stream by **Air Products (Great Britain) Ltd.** at Fawley, Hants, and will supply the nearby refinery of Esso Petroleum Co. Ltd. By-product gases will be marketed in cylinders to miscellaneous users. Capacity of the plant and nature of the process have not so far been revealed.

Similar plants are being constructed

to supply Guest, Keen and Nettlefolds at Cardiff and also Richard Thomas and Baldwin at Ebbw Vale, making it possible to develop the sale of cylinder gases in South Wales and the Midlands.

The U.K. market for industrial gases has hitherto been dominated by the British Oxygen Co. Ltd. Air Products is a subsidiary of the American group of that name, who own 51% of the capital, while the Butterley Co., Derby, own the remaining 49%.

Chemico Scrubbing for Iron Oxide Fumes

● A CONTRACT has been awarded by Midland Rollmarkers Ltd. to **Chemical Construction (G.B.) Ltd.,** who will supply a complete gas cleaning system to remove iron oxide fumes emitted during oxygen lancing of melting furnaces. With a capacity of 3,000 c.f.m., the unit will be installed at Crewe, and is due to start operating early in 1961.

Laboratory Block Contract

● GRIGGS AND SON LTD., building and civil engineers, London S.W.1, have been awarded a £25,285 contract to build a prefabricated laboratory-office block structure for a Government grant aided medical research organisation. The contract includes general extension of service ducts, drainage, retaining walls and pavings. A period of 33 weeks has been allotted for the construction and Griggs expect to start wor within the next few weeks.

Water Distilling Plant

● AN ORDER has been received by **G. and J. Weir,** Glasgow engineers, from the South-West African Administration, Water Affairs Branch, for a Weir Multiflash sea-water distillation plant. The plant will produce 120,120 imperial gall. of fresh water daily.

Gas Cleaning Plant Order for Head Wrightson

● THE £1.5 million contract from the Appleby Frodingham Steel Co. last month for sinter machines by **Head Wrightson Iron and Steel Works Eng. Ltd.,** has been followed by an order for a gas cleaning plant, capable of cleaning 8,100,000 c.f.h. of blast furnace gas. The plant will consist of two 18 ft. diameter washers and four 23 ft. 6 in. diameter precipitators, together with ancillary equipment and instrumentation.

The value of this plant which should be completed by the end of 1960, is over £450,000.

British Pumps for Russia

● FOLLOWING a visit of Mr. John S. Young, a director of **Craig Pumps Ltd.,** Burnfield Road, Giffnock, Glasgow, to Moscow, the company has received an opening order from the Soviet import authorities for the supply of their ceramic-lined chemical pumps as complete pump/motor sets. The firm is "very hopeful" that further substantial export business will develop from the contract.

Design of Void Spray Towers Discussed at Fertiliser Society

AN experimental plant-scale programme, devised to determine the effect of tower height, liquor rate, liquor concentration and counter and co-current operation was described by A. G. Calver and J. D. C. Hemsley (Fisons Fertilizers Ltd.) at a meeting of the Fertiliser Society on 27 October. Title of the paper was 'The design of void spray towers for silicon tetrafluoride absorption'.

The authors interpreted the data obtained from the programme in terms of simple mass-transfer theory, making particular note of problems met in the analysis of dense gases. Over a range of parameters studied it was concluded that:

1. Short towers have higher efficiencies per unit sprayed volume than tall towers.
2. The efficiency of a tower mainly depends on liquor rate.
3. Towers in which co-current flow exists are as efficient as counter-current towers.
4. Recirculating liquor concentrations of up to 18-20% w/w fluosilicic acid can be used without significantly affecting the absorption rate.

The higher efficiency per unit volume of short towers was demonstrated by the programme. It should be noted however that it is necessary to ensure that the available volume is fully sprayed. For tall towers, one spray nozzle centrally placed is adequate and is in any case desirable if nozzle blockages are to be minimised. In general, the spray height should not be less than 10 ft. nor more than 25 ft. Capital investment may be reduced by designing a tall tower and providing spray nozzles at intermediate points, though the desirability of being easily able to withdraw the nozzles for cleaning should be borne in mind. Co-current passes should be designed on the same basis as counter-current passes.

Gas velocities should be low enough to present excessive entrainment without recourse to the use of highly efficient spray eliminators with their attendant energy losses and liability to blockage by solids. A gas rate within the range 20-40 lb. moles/hr. ft.^{2} is recommended.

The absorption rate mainly depends on the liquid rate and a minimum rate of 1,000 lb./hr. ft.^{2} is necessary if tower investment is to be minimised. Though proportionality between the number of transfer units and the liquid flow rate (lb. moles/hr. ft.^{2}), has not been confirmed at rates above 330 lb./hr ft.^{2}, the relation found is linear and may be used with confidence up to 1,500 lb./hr. ft.^{2}. Ideally, it would be desirable to determine the size of the scrubber on economic grounds, taking into account capital investment, depreciation, power costs and so forth to arrive at a minimum operating cost; the data presented, however, is not considered sufficient for this purpose since it does not include the effect of liquid rate for spray heights of less than 24 ft.

Where liquor recirculation is to be practised, whether for fluorine recovery, or for more convenient effluent disposal, it is highly desirable to provide two stages of absorption, that is, a 'strong' acid wash and a 'weak' acid wash. A maximum concentration of 18-20% fluosilicic acid in the strong acid system is recommended as at higher concentrations the absorption rate is diminished. In the case of fluorine recovery, where the precipitated silica in the make acid is removed by filtration, the acid concentration is limited also by filtration problems which occur at around 18% fluorosilicic acid.

New Laboratory Block for James Anderson and Co.

NEW laboratory building of James Anderson and Co. (Colours) Ltd., Hawkhead Road, Paisley, Scotland, was opened on Wednesday by Lord Polwarth, chairman of the executive committee of the Scottish Council (Development and Industry).

James Anderson are one of the manufacturing companies of the Geigy group in Britain, and they specialise in the production of organic pigment colours for the paint, printing ink, paper and plastics industries. The new building comprises laboratories, with office and library accommodation, specially designed and equipped for expanding research and development work in the service of the pigment-using industries.

Hygrotherm Heat Generators to be Made in France

Hygrotherm Engineering Ltd. have recently licensed the firm of Petro-Fouga, 111 Avenue Victor-Hugo, Paris 16e, to manufacture their range of heat generators at Beziers, France. They will manufacture the heat generators, which are used in high temperature indirect heat transfer systems employing organic heat transfer media in the liquid or in the vapour phase. Sizes range from ½ m. B.Th.U./hr. up to 20 m. B.Th.U./hr.

Petro-Fouga also manufacture and erect complete chemical plant in mild steel, stainless steel and other alloys to Hygrotherm designs. The first complete installation to be engineered by the two companies will be the new synthetic resin plant at Elbeuf for Holden-Europe S.A., who are associated with Arthur Holden and Sons Ltd., Birmingham.

S.C.I. London Section Meeting Cancelled

Dr. W. Idris Jones will be unable to present his paper on 'The future of chemicals from coal' at the London Section, Society of Chemical Industry, meeting due to be held on 7 November. The meeting is therefore cancelled.

Chemico CO Removal Plant for West Midlands Gas Works

STILL cloaked in secrecy as 'Chemical Age' went to press on Wednesday were details surrounding the contract signed some two months ago by the West Midlands Gas Board for the first Chemico carbon monoxide removal plant. This is to be supplied by Chemical Construction (G.B.) Ltd. and Whessoe Ltd. under their agreement announced earlier this year (C.A., 16 January, p. 140).

The process is a Chemico development and is used by them on their ammonia plants. Under the agreement, Chemico will supply know-how and design, while Whessoe's contribution will be their experience and contacts in the gas industry, plus plant fabrication. Construction will probably be a combined operation.

Details of the process have been published previously (*Coke and Gas*, August 1960, p. 331), but the gas board has yet to announce the award of the contract officially, although this was referred to briefly in C.A., 15 October, p. 623. Reasons for the secrecy are thought to be twofold: 1, a disinclination to give publicity to any development that might appear to indicate a need to detoxify town gas; 2, a fear that publicity would lead to a demand from Members of Parliament, the Press and others for universal CO removal in all gas-making plants.

Although neither company will comment on this project, CHEMICAL AGE understands that about half of the gas boards of the country are currently interested in the process and by the end of the year further orders will most likely have been placed. Although neither of the companies nor the gas board will give any details of the contract, the CO removal plant will treat half the gas made at one of the W.M.G.B. works. If this unit proves successful, remainder of the gas will be treated, as will gas made at other plants of the board in Birmingham.

Universal application of the Chemico CO removal process is likely to add ¼d per therm to the cost of gas production. If only the most toxic gases are treated, then the additional cost, spread over total gas production, would be ¼d/therm.

The process makes use of the water gas shift reaction, in which carbon monoxide is reacted with water vapour in the presence of a catalyst (of the chromia-promoted iron oxide type) to yield carbon dioxide and hydrogen.

The process, as applied in industrial practice, is illustrated in the accompanying flowsheet. Feed gas passes to one of the duplicate boosters K1, of which one is a standby, and is then boosted to the required pressure, afterwards entering the base of the saturator F1, a steel tower containing wooden grid packing which is mounted vertically above and forms an extension of the gas cooler F2. Flowing upwards through F1 the gas passes in counter-current to a stream of hot water which humidifies it and so provides some of the water vapour required for the reaction. Steam is added in the proportion required and the mixed gas and vapour is partially heated in heat exchanger E1, and thence through a second heat exchanger E2 in which the gas/steam mixture is raised to reaction temperature in the region of 320-370°C, dependent on the oxygen content of the feed gas.

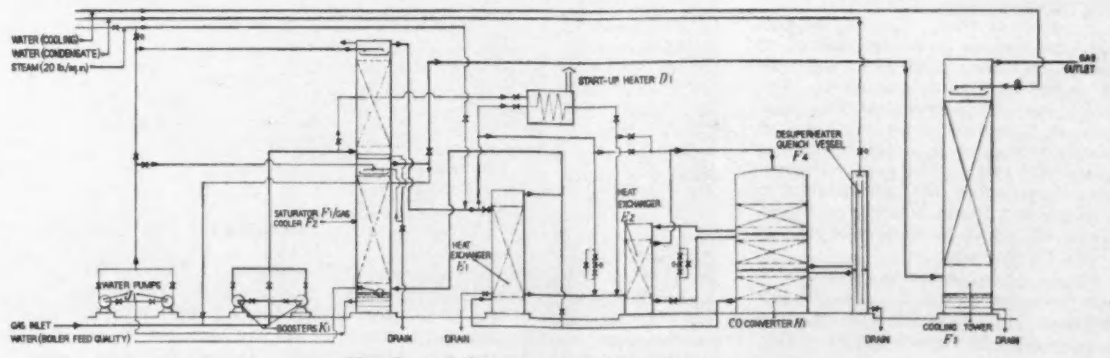
Three-stage Catalysis

The reactor is a steel vessel in which the catalyst is supported in three layers. After passing through the first stage of the catalyst in which the temperature rises to some 480°C, the gas leaves the converter and enters the heat exchanger E2, where it is cooled to approximately 370°C by exchange with the incoming gas. In the second layer of catalyst, further reaction raises the temperature of the gas to approximately 420°C. After this stage, the gas is cooled by direct quenching with water in a separate vessel F4 before reaction in the third and final layer of catalyst. From this last stage, the gas flows to heat exchanger E1 where it is cooled by indirect exchange with the incoming moist gas before entering the gas cooler F2. This tower uses the same water circulation system as the saturator tower F1, the purpose of the combined unit being to transfer heat from the product gas to the feed gas, steam being condensed from the first and evaporated into the second. This section of the tower is also fitted with wood grid packing. Water pumps J1 circulate water over the saturator and gas cooler from the reservoir in the base of the latter tower.

The gas leaving the gas cooler is further cooled by direct contact with water in a cooling tower, of similar construction to the other towers, to a temperature of 70°F, the gas then passing on to oxide boxes for removal of H_2S formed in the reactor from organic sulphur compounds present in the incoming gas.

Oxygen and hydrogen in the incoming gas react in the first layer of catalyst. This produces a temperature rise and to allow for this the temperature at the inlet to the converter is adjusted in proportion to the oxygen content of the feed gas. This additional heat of reaction eventually becomes available in the gas cooler and saturator, results in a higher vapour pressure in the saturator tower and consequently in a reduced steam requirement at the inlet to the heat exchangers. Thus the operating conditions for the plant are dependent in part on the oxygen content of the incoming gas.

Cost of CO removal can be partly offset if the process is operated in an area having a surplus of coke production, by allowing an increased proportion of C.W.G. to be blended into town gas, thus eliminating the equivalent coke production from the carbonising plant and consuming stocks of coke for which the market at economic prices is inadequate. The extra cost can be still further offset against the benefit of using more fully the capacity of carburetted water gas plants using primary flash distillate.



Flowsheet of the water gas shift reaction process

Fisons' Annual Report

Sir C. Fison Hints at Further Big Expansion in Chemicals

POLICY of Fisons Ltd. in regard to expansion and the possible take-over of other companies is referred to by Sir Clavering Fison, chairman, in his annual review, published on Thursday. Although the group has some very ambitious plans in view for fertiliser development, both at home and abroad, it has to bear in mind that there are limits to the possible expansion in this field, particularly in the home market. (For annual results see 'Commercial News,' p. 782.)

The fact that Fisons have become a very important company in the chemical industry generally has brought with it certain problems, one of which is that of size. Sir Clavering said "If we were a small company or a very large one we would not be concerned with this problem, but at our present stage I think we have to take the view that further substantial expansion is necessary."

There is in most industries an intensive process of regrouping to produce larger and more economic units. Broadly speaking, Fisons have come to the conclusion that with one or two exceptions the group interests will be served by expanding in industries where it already has a foothold.

Sir Clavering referred to the unsuccessful bids earlier this year for Crosse and Blackwell and British Drug Houses. He declared that in the past few weeks, the group had acquired a small company, Pickering and West Ltd., as part of its expansion in foods. Many other possibilities had been examined for acquisition. In some cases there have been negotiations and he does not exclude the possibility that Fisons will be able to secure companies at reasonable prices that would add strength to the group.

Fertiliser Profits

Turning to future prospects, Sir Clavering said that further significant price cuts have been made on fertilisers and that Fisons do not hope to achieve the same exceptional level of profit on fertilisers this year. Projections for subsequent years, however, show a resumption of the strong upward trend.

Fertiliser Division. During the past year, the increase in consumption of all types of fertilisers in the U.K., expressed in plant food units was about 15%, which was quite phenonemal. This large increase for which Fisons had not budgeted resulted in a substantial and unexpected increase in profit. The upward consumption trend was expected to continue, but Fisons believe that the increase will return to the normal level of about 4% per year.

Fisons Horticulture have set up a new company in the Netherlands with Albatros Superfosfaatfabrieken N.V., to develop sales in Benelux and West Germany.

Chemical Division. Results were very satisfactory, both as regards the improvement in overall profitability, 20% higher, and the fact that it was better spread between individual companies in the division. This was the first year in which all companies made profits; the improved position was also to be seen in the light of the large research investment.

Fisons Pest Control

Fisons Pest Control made their first profit since acquired by Fisons more than five years ago. The heavy losses sustained in this period had not deterred the company from making a big investment in research. There was a minimum size to the research effort which was likely to be profitable and Fisons had therefore thought it necessary to make large outlays of the order of £250,000 a year. Only now were Fisons getting the benefits, and indeed not yet the full benefits, of that investment.

A number of new products were now under development at the "active and creative research department" of Benger Laboratories Ltd.

The third year of the reorganised Whiffen business, the period again saw satisfactory progress. Export turnover was particularly satisfactory and was up 33% on the previous year. Whiffen and Sons have important contracts under negotiation with the U.S.S.R.

The interest in Fine Chemicals of Canada Ltd., held jointly by Fisons and Harrisons and Crosfield (Canada) was disposed of to a U.S. concern.

Referring to Fisons Chemicals (Export) Ltd., Sir Clavering declared that direct exports and sales of overseas subsidiaries, excluding fertilisers, amounted to nearly 40% of total sales. All Chemical Division companies achieved satisfactory increases, the largest being Fisons Pest Control. It was felt that the research content of overseas sales must necessarily increase to protect the group from competition from both local and other exporting countries.

Research. Spending on research and technical services during the year amounted to well over £1 million. Processes for the manufacture of fertilisers of great concentration coupled with readily variable ratios of the main nutrients were now being developed in laboratories in Europe and the U.S. and it was believed that the work at Levington was in the front line of progress.

At Chesterford Park, the complex task of finding chemicals with unique advantages in the control of pests and diseases continued with ever increasing pressure. Much of the work was on behalf of agriculture overseas, where the main future demand was expected to lie.

U.K. Firms Spend £6.25 Million on Search for New Drugs

MORE than £6,250,000 was spent on research and development for new and improved drugs by members of the Association of British Pharmaceutical Industrry (A.B.P.I.) last year; this was an increase of more than £1 million on 1958 and double the amount spent in 1954. The research establishments carrying out this work employed 1,374 graduates and 2,664 other staff. In addition, £273,013 was donated to independent research organisations.

Announcing the research figures in his presidential speech at the A.B.P.I. half-yearly conference in Torquay last week, Mr. H. W. Palmer, managing director, Glaxo Laboratories Ltd., added: "The achievements by the industry in research devoted to the discovery of more effective drugs and in the export trade are a major contribution to the health and economic welfare of the community. However, the very success of the industry in bringing forward more new drugs means that extra facilities must be provided for their clinical trial in hospitals and in general medical practice."

All drugs placed on the market for National Health Service use were screened by an independent Health Service committee and if the committee felt that a drug was not of proved therapeutic value, doctors were advised not to prescribe it. The committee recently undertook to give advice and help where further clinical trials were indicated. A.B.P.I. regard this extension of the committee's functions as providing only an interim and partial solution of a problem which may become acute as the industry's research efforts continue to expand.

The association is therefore now considering proposals for improving and extending the existing facilities for clinical trials in co-operation with the medical profession.

International Road Tar Association

Next plenary session of the International Road Tar Association will be held at Harrogate from 29-31 May 1961. The session will include a visit to the Coal Tar Research Association laboratories at Gomersal, near Leeds.

Esso's 100,000 Bbl./Day Refinery on Stream at Milford Haven

Pipestill furnace has a heat output of 465 million B.Th.U./hr. from 52 burners. On the right is the associated distillation column.

THE £18 million refinery of Esso Petroleum Co. Ltd., due to be opened on Thursday this week by the Duke of Edinburgh, has an initial crude throughput of 4.5 million tons a year (100,000 b.p.s.d.). Construction was completed on schedule in October—in just over two years—by the main refinery contractors, Foster Wheeler Ltd., who also built Esso's other U.K. refinery at Fawley, which, with an initial throughput of 6 million tons, is now processing 10 million tons/year.

In addition to Foster Wheeler, other contractors were: George Wimpey and Co. Ltd., John Mowlem and Co. Ltd., Whessoe Ltd., W. Neill and Sons (St. Helens) Ltd., and Motherwell Bridge and Engineering Co. Ltd.

A three-quarters-of-a-mile road was constructed to take nearly 250,000 tons of materials, valued at about £6 million, to the 350-acre site. In addition seven-and-a-half miles of refinery road were built. More than 99% of all materials used in construction were British made. The marine terminal, designed by Foster Wheeler, can accommodate two tankers up to 100,000 d.w.t. each, plus smaller coasters.

There are four principal refining units; primary crude oil distillation and light-ends recovery unit; Powerformer, which converts low octane naphtha from distillation into high octane motor spirit; copper chloride sweetener, for removal of unwanted compounds from petrol and jet fuel; and a Hydrorefiner which catalytically removes sulphur from gas and diesel oils.

One of the outstanding features is the 100,000 barrels per stream day pipestill, one of the world's largest with a heat output of 465 million B.Th.U./hr. Here crude oil is heated to a temperature of about 750°F. Milford Haven is the first U.K. refinery to use only air for the final cooling of hot products, thus considerably reducing the risk of pollution. There are 14 Air-fin cooler units.

Another of the main features of the new refinery is the very high degree of automation. All units are automatically controlled from one central control room. A second control room electronically records the liquid level and temperature of every tank on the site.

One of the many 'big lifts' in construction of the project involved a fractionator tower for the distillation unit. Measuring 221 ft. long and 9 ft. in diameter, this was lifted from the horizontal to the vertical and bolted to its foundations in two and a half hours.

Each year the refinery will consume some 100 million kW hours electricity and about 360 million gall. of fresh water for steam raising. There are 69 process and storage tanks with a total capacity of 189 million gall., and varying in size up to 54 ft. high and 150 ft. diameter.

Details of some of the units were given in a progress report on construction in CHEMICAL AGE, 10 October 1959, p. 483.

In the background are the crude oil distillation unit, light ends recovery unit and Powerformer.

U.K. Engineer Invents Flexible Seal Door for Skips and Bunkers

A FLEXIBLE seal door, claimed to be ideal for fitting to any bunkers containing fine granular material or material of an adhesive nature has been designed by Mr. A. Barker, a development engineer at the Central Engineering Establishment of the National Coal Board. It was designed to overcome the sliding friction inherent in vertical steel-plated guillotine type doors used on skip containers and horizontal sliding doors fitted to bunkers.

The invention comprises a flexible seal held across a discharge opening by a series of support rollers mounted in a movable carriage frame which can withdraw and replace the seal. One end of the seal is attached to the top of the opening and the other, after being inserted between the opening and the support rollers, is lapped around the first support roller and fixed to the movable carrier which consists of two side plates, joined by tie bolts forming spindles on which the rollers rotate, and is supported under an opening by a set of guide rollers.

As the carriage is retracted the support rollers withdraw from the seal and the now loose seal is peeled away from the opening in the form of a loop, allowing the material to discharge; as it is advanced, the support rollers progressively replace the seal across the opening.

Since the action of withdrawing the support rollers is rotational and the seal peels away from the opening, friction between the door and the material stored is eliminated. It is also claimed that the door is easily operated, requiring considerably less power than a conventional sliding door, and that it overcomes problems of jamming or freezing.

CHEMICAL PLANT MAKERS TOLD "EXPORT TRADE IS VITAL TO HOME MARKET SALES"

UNLESS Britain could substantially increase her export trade, she would have to cut imports, leading to a lowering of the standard of living. At the moment Britain was living beyond her means and exports had never been so vital as they were today. This was stated by Sir William McFadzean, president of the Federation of British Industries, when he replied to the toast of 'The Guests' at the annual dinner in London last week of the British Chemical Plant Manufacturers' Association. Mr. Norman C. Fraser, chairman, presided over a company of about 1,350 members and guests.

It was widely held, declared Sir William, that a company's export trade depended on its sales at home. That was no longer true and he suggested that the reverse was the case today. A flourishing export trade was fast becoming a prerequisite of the maintenance of the U.K. market. The need for action was now. He hoped the B.C.P.M.A. would encourage member-firms who were not doing enough in the export field to take a much more active interest in it.

The European market in particular should be exploited. It was one of the world's most dynamic economies. The greatest possible increase in trade was between the highly industrialised states.

Sir William did not favour special taxation adjustments on exports. Much had already been achieved in abolishing export subsidies and Britain's aim was to get competition on as fair a basis as possible. He strongly advocated, however, that the Government should give more encouragement to the individual.

Sir William said that the chemical plant industry had much to be proud of in the export field, particularly in connection with some of the large overseas plant contracts that had recently been awarded to British firms.

The industry was playing an important role so far as the emergent countries were concerned. Many of those countries had emerged into independent status almost overnight. They must be treated as equal trading partners, but there was a great inequality in industrial experience and technical knowledge. In tendering, it had to be remembered that those emergent countries did not possess knowledge of what was entailed in the construction of large works. What British firms must do was to go out and draw up the specification themselves. Through not doing that they were losing out; some big firms were not as quick off the mark as their overseas competitors.

Proposing the toast, Mr. Fraser declared that apart from members' direct exports, sales of chemical plant to the U.K. chemical industry meant more chemical exports. Only one item of plant might be sold overseas, but the sale of the same item to a U.K. chemical producer meant much more in the way of exports.

$80 m. Beryllium Industry— U.S. Industrialist's Prediction

PROSPECTS of beryllium ore production becoming a major industry in the U.S. were discussed by Mr. B. Odlum, president of Beryllium Resources Inc., in Salt Lake City recently. He said it was known that beryllium minerals exist in sufficient quantity to free the U.S. from its absolute dependence on foreign ore. Speaking before the Utah Securities Dealers Association, Mr. Odlum said: "As a result of our work at Delta, Utah, in Alaska, elsewhere in the U.S. and in foreign countries, we know now that beryllium minerals occur in sufficient quantity to allow the industry to expand to a major industry." Beryllium, he said, was "taking on the insidious characteristics of 'glamour' that were attached to uranium and titanium a few years ago."

He pointed out, in relation to nuclear power plants, that if the U.K.'s gas-cooled reactor at Windscale performs as expected, it will create a demand of between 40 and 100 tons of beryllium annually. This is the equivalent of between 1,000 and 2,000 tons of beryl ore —nearly 20% of present-day consumption of beryllium ore in the U.S. According to Mr. Odlum, "continuous growth of the beryllium industry is clearly indicated—growth to date has doubled every other year. Today's $40-million industry will surely be tomorrow's $80-million industry."

A.P.V. to Sell Anhydro Spray Drying Plant

An agreement just concluded with Anhydro A/S of Copenhagen, Denmark, will enable the A.P.V. Co. Ltd., of Crawley, Sussex, to sell Anhydro spray drying and cooling plant in Great Britain and in a large part of the world.

This agreement provides A.P.V. with plant which is complementary to their evaporators in installations for the dehydration of liquids.

Letter to the Editor

Monsanto's Ready-mixed Inhibitors for Anti-freeze

SIR,—The article on page 662 of CHEMICAL AGE dated 22 October refers to various inhibitors used in anti-freeze and states that Monsanto and W. J. Bush are the major suppliers of one of these inhibitors. The article goes on that Bush market a ready-mixed inhibitor under the trade name of 'Sobenite'. We would like to point out that Monsanto also market ready-mixed inhibitors, simply describing them as benzoate nitrite mixtures.

We feel this is worth mentioning, since anyone reading the article would be given the impression that Bush are the only supplier of a ready-mixed inhibitor.

Yours, etc.,

I. H. GATES,
Sales Manager, Fine Chemicals.
Monsanto Chemicals Ltd.,
Monsanto House,
London S.W.1.

O.C.C.A. Conference on Surface Coating Physics

NEXT biennial conference of the Oil and Colour Chemists' Association will be held at Torquay, from 30 May to 3 June 1961, with headquarters at the Palace Hotel. General title of the conference is 'Physics in surface coatings' and nine papers, as follows, will be delivered in three morning sessions on Wednesday, Thursday and Friday.

'The coating and the substrate,' by T. R. Bullett and A. T. S. Rudram (Paint Research Station); 'The physical behaviour of paint films,' by G. Phillips (Atomic Weapons Research Establishment, Aldermaston); 'The physics of brush marks,' by N. D. P. Smith, S. E. Orchard and Dr. A. J. Rhind-Tutt (I.C.C. Paints Division); 'Painting porous building materials,' by G. W. Mack (Building Research Station) 'Some aspects of the physical assessment of emulsion polymer films,' by H. Williams (British Resin Products Ltd.); 'Wetting adhesion and penetration of surface coatings on wood,' by Dr. V. R. Gray (Timber Development Association); 'The behaviour of printing ink on rollers,' by C. C. Mill (Patra); 'Solar reflectivity of paints,' by Dr. R. N. C. Strain (Royal Aircraft Establishment, Farnborough); 'The correlation of service behaviour with observed physical characteristics of air-drying paints for structures,' by D. P. Earp and F. G. Dunkley (British Railways Research Department).

Visits will be made to the I.C.I. Marine Research Station at Brixham.

One of the 'Late' Frazers

"Fraser's late on delivery as usual." Although W. J. Fraser and Co. Ltd. are one of our leading chemical engineering and contracting companies this quote does not imply criticism of their plant deliveries.

It came from Mrs. Norman C. Fraser, wife of the chairman of the British Chemical Plant Manufacturers' Association, and was quoted by her husband when he proposed the toast of 'The Guests' at the B.C.P.M.A. annual dinner (see this page). Mr. and Mrs. Fraser were expecting delivery of a grandchild in August, but the offspring was obviously 'late on site.'

SCIENTIFIC RUSSIAN WITHOUT TEARS

Part 5—Vocabulary

By Professor W. J. Perry

(University of Arizona, Tucson, Arizona, U.S.)

ATTENTION has already been directed to a number of important characteristics of the Russian language. The use of the Russian alphabet in phonetically spelling out familiar terminology was pointed out early in this series. Similarities in sentence structure and in grammar were illustrated by many examples.

To read scientific Russian, it is not enough to know the alphabet and to understand the basic principles of grammar. It is also necessary to know the meaning of a rather considerable number of individual words. Memorising a Russian-English dictionary is a forbiddingly formidable task, while locating individual words in a dictionary is time-consuming and tedious. It is the purpose of this paper to point out how the burden of remembering Russian words can be eased and how the number of words that must be looked up in the dictionary may be reduced—at least to an encouraging degree.

It is by no means unusual in English for a considerable number of words to be derived from a single basic term or root, as it is sometimes called. Thus we have much related terms as 'hot', 'heat', 'heater', 'superheat', 'superheater', etc. Russian does the same sort of thing, but to a much greater extent and much more consistently. The simple patterns of word derivation are so extensively applied to generate Russian words that only a very few examples of such derived words can be presented in this paper. In fact, it is not even possible to show all the different ways in which Russian words are interrelated. A book entitled 'Russian Scientific Terms—Their Structure and Meaning', is now in preparation (Interscience Publishers, 1959).

In English, the same word may be used both as noun and adjective. Thus, the words 'sodium' or 'quartz' are used both as nouns and also as adjectives in such expressions as 'sodium atom' or 'quartz lens'. In Russian, a careful distinction is always made between nouns натрий (sodium) or *кварц (quartz) and corresponding adjectives in many expressions such as натриевый *атом (sodium atom) and *кварцевая *линза (quartz lens).

The suffixes -н-, -ян-, -ан-, -енн-, -ическ- (note similarity to German -isch as in 'photographisch'), -ичн-, and -ов- (-ев-) are used particularly frequently in forming adjectives, or more precisely the stems of adjectives to which endings are then attached. (In the following examples the endings -ый, -ой and -ий indicate the nominative masculine, singular forms.)

Adjective		*Noun*	
видный	visible, prominent	вид	form, aspect, appearance, view
горный	mountainous, geological, mining (adj.)	гора	mountain
железный	made of iron, ferric	железо	iron
средний	neutral, average (adj.), neuter	среда	medium (noun) surroundings (sing. in Russian)
кожаный	leathery, leather (adj.)	кожа	leather, skin
нефтяной	petroleum (adj.)	нефть	(fem.) petroleum
соляной	salt (adj.), salt-containing	соль	(fem.) salt
мысленный	mental, imaginary	мысль	(fem.) thought
численный	numerical	число	number
*химический	chemical	*химия	chemistry
*электрический	electrical	*электричество	electricity
первичный	primary	первый	first
*энергичный	energetic	*энергия	energy
мочевой	urinary, urine (adj.)	моча	urine
паровой	vaporous, steam (adj.)	пар	vapour, steam

In English, the suffix '-ish' is quite often used to tone down adjectives. Russian uses the suffix -оват- (less common alternate form -еват-). A more limited degree of relationship to the parent word may be denoted by the suffix -ист-.

сладковатый	sweetish	сладкий	sweet
синеватый	bluish	синий	blue

More than one adjective may be derived from a single noun, e.g.

тепло	heat, warmth		
теплый	warm, hot	тепловатый	lukewarm

камень	(masc.) stone		
каменный	stone (adj.)	каменистый	stony
серебро	silver		
серебряный	made of silver, silver (adj.)	серебристый	silvery

Such adjectival suffixes have been used extensively in chemical nomenclature, as for example:

хлорноватистая кислота	$HClO$
хлористая кислота	$HClO_2$
хлорноватая кислота	$HClO_3$
хлорная кислота	$HClO_4$

For more detailed discussion see 'Chemical Russian, Self-taught', J. W. Perry, Mack Printing Co., Easton, Pa.—especially Chapter 4.

Russian makes extensive use of suffixes to form various types of noun that are of frequent occurrence and great importance in scientific and technical writing. Only a very few examples of the more important types can be given.

*амфотерность	amphoteric character	*амфотерный	amphoteric
*пластичность	plasticity	*пластичный	plastic (adj.)
близость	proximity	близкий	near
летучесть	volatility	летучий	volatile
плоскость	plane surface	плоский	flat
яркость	brightness	яркий	bright

The suffixes -от-, -б-, -ин-, and -иц- are used in a similar way to form feminine nouns that denote an abstract quality or a thing or concept characterised by some quality.

кислота	acid	кислый	sour, acidic
работа	work	раб	slave
чистота	cleanness, purity, cleanliness	чистый	clean, pure
дружба	friendship	дружный	friendly
служба	service	служить — послужить	to serve
длина	length	длинный	long
мочевина	urea	моча	urine
разница	difference	разный	different

Masculine nouns, formed with the suffixes, -ак-, -як-, -ик-, and -ок- denote persons, concepts or things more or less closely related to the parent word. Sometimes, these suffixes form diminutives.

*ботаник	botanist	*ботаника	botany
вторник	Tuesday	второй	second
железняк	iron ore	железо	iron
белок	protein, albumen, white (of eye or egg)	белый	white
мышьяк	arsenic	мышь	mouse
цветок	(small) flower	цвет	flower, colour

The suffix -тел- is extensively used to form masculine nouns denoting an action as indicated by the corresponding verb.

держатель	holder	держать—подержать	to hold
краситель	dyestuff	красить—накрасить	to dye, to colour
носитель	carrier	носить—поносить	to carry, to wear
писатель	writer, author	писать—написать	to write

The suffixes -ени- and -ани- form neuter nouns denoting actions, processes or, less commonly, the result of an action as indicated by corresponding verbs.

беление	bleaching	белить—побелить	to bleach
давление	pressure	давить—подавить	to exert pressure
растение	plant (botanical)	расти—вырасти	to grow
течение	flow, course	течь—потечь	to flow, to run
горение	combustion	гореть—сгореть	to burn
*фильтрование	filtration	*фильтровать- *профильтровать	to filter

The suffix, -ств-, is used to form neuter nouns denoting generalised abstract concepts.

братство	brotherhood, fraternity	брат	brother
меньшинство	minority	меньший	less
рабство	slavery	раб	slave
общество	society, community	общий	general (adj.) public (adj.)
равенство	equality, equation	равный	equal, alike

INDUSTRIAL WASTE PROBLEMS DISCUSSED AT LONDON EFFLUENT CONVENTION

CONDITIONS of acceptance by local authorities for effluent discharged into the sewage system vary from one area to another. This was stated in a paper on 'Problems of Design in Effluent Plants', given by J. W. Oakley at the first effluent and water treatment convention held at Seymour Hall, London W.1, on 18-21 October. But, in general, all ask for the removal of excess suspended solids, for the discharge to be within a specified pH range and for the temperature not to exceed 110°F. Limits are also placed on toxic constituents such as chromium, nickel, copper and other metals, and also on cyanides.

The limit for suspended solids varies from about 200 to 500 p.p.m. and the pH range specified is usually 6 to 12.

Limits on metals and other toxic substances depend on the size of the sewage works and the volume of effluent in relation to the general sewage discharge.

Metal Pickling Wastes. These vary in pH from 2 to 6. They are treated with an alkali (generally lime) in a tank fitted with a stirrer. Disposal of the settled sludge is a difficult and expensive problem. Soda ash instead of lime produces less solids but causes effervescence and produces soluble sulphates which could attack concrete sewers. Caustic soda would prevent foaming but would still produce soluble sulphates.

Metal Processing Wastes. These contain proprietary solutions, cyanide plating and cleaning solutions, acid wastes, chromates, and alkalis. Treatment involves destruction of cyanides, reduction and precipitation of chromates, neutralisation, and precipitation of metals followed by settlement. Batch treatment is ideal from the point of view of control but, apart from small plants, the tank volume necessary would be excessive. In larger plants batch treatment is used for spent solutions and continuous treatment for rinse waters.

The problem must be tackled at the source. It is the concern of the manufacturer and plating process supplier to minimise carry over of strong solutions by efficient draining of articles, use of drag out tanks and counter current flow rinses, and in some cases recovery of solutions.

Plant and Equipment. Treatment tanks must be large enough to allow for considerable variations in flow and composition of effluent. If they are small they must be preceded by balancing tanks.

Mixing apparatus is used to balance the effluent composition and to promote rapid and intimate dispersion of reagent for rapid reaction. Mixing tanks with brick or other baffles set in a sloping floor have been used. Air from perforated pipes or diffusers is also possible but is expensive and not suitable for reduction processes. In continuous flow plants high speed propeller type stirrers are used while in batch treatment tanks with heavy sludge deposits slow speed paddle blade stirrers have been employed; but it appears that high speed stirrers can also be used here.

Manufacturers are in general reluctant to incur the capital cost of automatic instrument control, But in larger plants where the relative cost is less, applications are increasing. In many situations a strong case can be made for pH controllers. Oxidation-reduction control instruments are also being used to a limited extent, but applications will no doubt increase.

Treatment tanks can be rectangular, with length three or four times greater than width; vertical flow, being fed by a central feed pipe dipping below liquid level to a point above the top sludge level; and radial flow tanks, which are shallow circular tanks with diameters large in relation to depth. Effluent enters at the centre and flows outward to peripheral collection weirs. The velocity falls from centre to periphery so that heavy particles settle near the centre and lighter ones further out.

Some effluents are virtually impossible to deal with in continuous flow tanks because too much sludge is formed.

Use of Chlorine

A paper dealing with 'Chlorine and Sulphur Dioxide in the Treatment of Crude Waste', was presented by P. E. Cockill and J. Malpas. Two reactions are of fundamental importance when considering the application of chlorine in water treatment. First the reaction with water in which hypochlorous and hypochloric acids are formed. The hypochlorous acid then ionises partially to produce hypochlorite ions in addition.

Second, the reaction when ammonia is present. Here there are three possibilities depending on proportions and pH:

$$NH_3 + HOCl = NH_2Cl + H_2O$$
$$NH_3 + 2HOCl = NHCl_2 + 2H_2O$$
$$NH_3 + 3HOCl = NCl_3 + 3H_2O$$

In the presence of excess chlorine, the chloramines break down completely with the formation of hydrochloric acid and nitrogen.

In alkaline solutions, cyanides are destroyed by chlorine according to the following reactions:

(1) $NaCN + Cl_2 = NaCl + CNCl$

(2) $CNCl + NaOH = NaCNO + HCl$

Reaction (1) occurs almost instantaneously at all pH values. Reaction (2) is dependent on a number of factors, of which pH is the most important. Above pH 10 the reaction is extremely rapid. Below this value the rate of hydrolysis decreases and below pH 8 it becomes extremely slow. Since cyanogen chloride (CNCl) is an objectionable, toxic gas it is essential that (2) should take place as rapidly as possible. The pH must therefore be kept high. It is found that large quantities of ammonia do not interfere with this process.

Hexavalent chromium can be treated with sulphur dioxide according to the reaction:

$$2H_2CrO_4 + 3H_2SO_3 = Cr_2(SO_4)_3 + 5H_2O$$

Below pH 1 the reaction is virtually instantaneous, is extremely rapid up to pH 2, but gradually decreases as pH increases. At pH 4 complete reduction may take an hour and at pH 5 it is doubtful if it is ever complete. In practice it is found necessary to keep the pH below 2.5.

After reduction to trivalent chromium the next step is precipitation which is done by raising the pH to 8.5 using lime or caustic soda.

Chlorine has many other uses in effluent treatment apart from the removal of cyanides. Its bleaching action is particularly useful in the textile and paper industries for the removal of highly coloured dyes. Sulphides may also be destroyed, and chlorination is often used to remove the unpleasant odour due to their presence.

Phenols, which occur in coke oven wastes, can be removed by chlorine if proper attention is paid to the reaction conditions. The best pH range is about 7 to 10. Phenolic destruction cannot, however, take place until all the ammonia has first been removed.

Reduction of biological oxygen demand (B.O.D.) of effluents has been investigated. It is thought that chlorine can bring about a reduction of B.O.D. but is not a substitute for biological filtration. Chlorination is, however, valuable in the delay of septicity.

Chlorination is used for two coagulation processes. First is the preparation of copperas by the reaction:

$$6FeCO_4 \cdot 7H_2O + 3Cl_2 = 2Fe_2(SO_4)_3 + 2FeCl_3 + 7H_2O$$

Second is the preparation of chlorine activated silica. Chlorine has the advantage over other methods of activation that it can be carried out continuously.

Apart from the reduction of chromium wastes, sulphur dioxide has very little application in trade waste treatment. There is a possibility that it may be used for dechlorination as is already done in normal water supply processes.

Chemical Firms at British Trade Fair, Moscow

A number of chemical and allied firms will be among the 600 exhibitors at the £2 million British Trade Fair which will be held in Moscow from 19 May to 4 June next year. Firms exhibiting in the 'chemical and pharmaceutical' category include I.C.I., Distillers, Fisons, Marchon Products, Pfizer, Benger Laboratories, Genatosan and Loughborough Glass Co.

Well known plastics, rubber and ceramics manufacturing concerns appear in the 'materials' category, while such firms as Elliott Bros. (London) Ltd., Negretti and Zambra, E.M.I. Electronics, Kelvin Hughes and Mullard Equipment will show scientific instruments.

Overseas News

E.N.I. RELEASE DETAILS OF GELA PETROLEUM AND CHEMICAL PLANTS

THE complex of plants which the State-controlled E.N.I. are building at Gela, Sicily, will process yearly about 2.5 million tonnes of crude oil from the local oilfield. There will be three groups of plants: petroleum, petrochemical, and a 150,000 kW power station.

The petroleum group includes the following plants: desalination, distillation, fractionation, hydrogenation, catalytic reforming, stabilisation, solvent extraction, production of hydrogen and sulphuric acid, and ethylation.

The cost of this group (including the cost of land, storage tanks, ancillary services, etc.) will be Lire 50,000 million.

The petrochemical group will comprise plants for the fixation of air, production of hydrogen, cracking, polymerisation of propylene, polythene, ethylene oxide, ethanolamine, ethylene glycols, synthetic gas, synthesis ammonia, urea, ammonium sulphate, and ethane. The cost of this group (including the cost of land and ancillary plants and services) will be Lire 36,000 million.

The power station will cost Lire 16,000 million.

When fully operational, the Gela plants will have the following annual outputs:

Petroleum products: Liquefied petroleum gases, 60,000 tonnes; premium gasoline, 70,000 tonnes; normal gasoline, 355,000 tonnes; diesel oil, 690,000 tonnes; fuel oil, 450,000 tonnes; sulphuric acid (Gela crude contains a high percentage of sulphur), 110,000 tonnes.

A large quantity of petroleum-grade coke will also be produced for use as fuel in the power station.

Petrochemicals: Ethylene, 2,000 tonnes; polythene, 15,000 tonnes; ethanolamine: mono-, 1,500 tonnes; di-, 550 tonnes; tri-, 500 tonnes; glycols: mono-, 13,000 tonnes; di-, 1,300 tonnes; tri-, 150 tonnes; tetramer, 4,000 tonnes; ammonium sulphate, 150,000 tonnes; urea, 60,000 tonnes.

Rohm and Haas to Revamp Government Butadiene Plant

Rohm and Haas will spend some $12 million over the coming year on the overhaul and extension of the Louisville butadiene plant recently purchased from the U.S. Government at a cost of $6 million. Ammonium sulphate, as well as monomer methylmethacrylate and other materials for the plastics industry, will be produced instead of butadiene at a new production unit to open next summer.

Benzene Production at B.P.'s Dinslaken Refinery

Some 6% of the total production of the Dinslaken oil refinery opened this month by the German subsidary of British Petroleum, B.P. Benzin und Petroleum AG, will be high-purity benzene for the petrochemical industry. A further 4 to 5% of output will be of liquid gas and aviation fuel. The refinery is fed with Middle East and Venezuelan oil by a pipeline of Nord-West-Ölleitung GmbH from the North Sea port of Wilhelmshaven. The refinery will be working to its full annual capacity of 4 million tonnes by 1962.

Shell to Build Sulphur Plant in Canada

Shell Oil of Canada is to build a $20 m. gas processing and sulphur manufacturing plant in the Pincher Creek district of Southern Alberta. The plant will be operated by Shell and was expected to be completed before the end of next year.

Initially it will be designed to produce approximately 100 m. cu. ft. of processed gas a day for delivery to Alberta and Southern Gas Company for export to the U.S. It will also produce approximately 1,000 tons of sulphur daily and between 3,500 and 4,000 barrels of liquid products daily.

Argentina Consumes 13% Less Caustic Soda

Argentina's consumption of caustic soda in 1958 and last year was estimated at 62-65,000 tons, compared with 70-75,000 tons in the previous two years.

Argentine production is estimated at 33-34,000 tons/year although installed capacity is 60,000 tons and the eight companies manufacturing caustic soda could produce 53,000 tons a year. Failure to use this capacity is attributed to the large amount of caustic soda which is imported at very low prices.

Rumania Plans Big Expansion in Chemical Output

About 20% of all industrial investments to be made in Rumania in the period ending 31 December 1965 is to be in the chemical industry, it is announced. By 1965 the country's industry is scheduled to produce annually 500,000 tonnes of synthetic fertilisers (9.6 times the 1959 figure), over 95,000 tonnes of plastics and synthetic resins (over 14 times 1959) and 13,000 tonnes of synthetic fibres and yarns (43 times last year's output). By the same year 34,000 tonnes of cellulose-based fibres and yarns, 50,000 tonnes of synthetic rubber, 10,000 tonnes of insecticide, 15,000 tonnes of fungicide and 1,000 tonnes of weedkiller will be produced annually in Rumania, as well as 2.9 times the present production of soda.

Production expansion will be centred on new plants being built at Craiova (nitrogenous fertilisers, acetic acid, butanol, etc.), at Turgu Mures (ammonia and urea) and Braila (synthetic fibres), while the petrochemical industry will be developed by new and expanded units at Ploesti and Borzesti, the latter of which will produce the country's planned 50,000 tonnes of synthetic rubber per year.

German Polythene Plant for Pakistan

The Government of Pakistan has approved a proposal by Chemische Werke Lahr GmbH chemical concern, Lahr, West Germany, to build a polythene plant at Lyallpore. Investments required are in the nature of Rs.45 million, of which about Rs.22 million will come from Germany.

Wyandotte Plan Plant in Canada

Wyandotte Chemicals Corporation, Wyandotte, Mich, who have been selling in Canada for 40 years, have announced plans for a Canadian manufacturing operation. They are to build a 48,000-sq. ft. plant on a 10-acre site in eastern Metropolitan Toronto to produce initially products of its J. B. Ford Division, including bottle washing alkalis, laundry and sanitation products.

Natural Gas Plan for Roma Power Station

Natural gas will power the Roma (Queensland) electricity generating station under a scheme on which work will begin immediately. The gas will come from two wells sunk by Mines Administration Pty. Ltd. near Roma. The power station at present burns oil and wood to drive the generators.

Poland's Plans to Raise Fertiliser Outputs

By 1965 Poland is planning to have raised her annual output of nitrogenous fertilisers to 430,000 tonnes (244,000 tonnes in 1960). Phosphoric fertilisers will similarly rise from 207,000 tonnes a year to 400,000 tonnes. Production of insecticides is to be doubled over the period, so that by 1965 it will be running at an annual worth of Zloty 100 million.

High-performance Epoxides from Union Carbide Plant

Facilities to produce more than 10 million lb./year of epoxides and other oxygenated chemicals have recently been completed at the Institute, W. Va., plant of Union Carbide Chemicals. Among the new epoxy chemicals from the new facility are epoxide-201 (3,4-epoxy-6-methylcyclohexylmethyl - 3,4 - epoxy - 6 - methylcyclohexane-carboxylate), epoxide-206 (vinylcyclohexene dioxide), epoxide-207 (dicyclopentadiene dioxide), and Flexol plasticiser EPO (epoxidised soybean oil). The company also plans to produce *epsilon*-caprolactone in the unit.

With low-cast anhydride hardeners, epoxide-201 forms resins with heat-distortion temperatures above 300°F.

(*Continued on p. 780*)

ADVERTISER'S ANNOUNCEMENT

Ciech IMPORT AND EXPORT OF POLISH CHEMICALS

Achievement of Poland's plans for foreign trade depends on the scope of activity on the part of the State foreign trade enterprises.

A few hundred chemical plants in Poland are represented by the foreign trade enterprise CIECH in all their import and export dealings with foreign businessmen. In 1960 CIECH—Import and Export of Chemicals—celebrates the 15th anniversary of its foundation.

The first stage of Ciech's activities was concerned mainly with imports. Gradually, however, with the reconstruction and growth of the Polish chemical industry, Ciech turned to the export of chemicals, modestly at first, but continually developing over the years.

Beginning with 1957, the export of chemicals grew rapidly, reaching about 30% annually. In relation to the value of total Polish exports, exports of chemical products from Poland in 1959 amounted to 4.4%, and imports of chemicals to 8.7%. The five year plan (1960-1965) provides for a two-and-a-half-fold increase in the production of the chemical industry and a twofold increase in exports of chemical products. Polish chemicals are highly appreciated by our foreign customers, as evidenced by the continuous growth of business contacts with importers throughout the world. In 1950, our chemicals were exported to 36 countries whereas in 1959 they were sent to more than 60 European and oversea countries.

On account of the ever-growing and intensive trade activity of our enterprise, Ciech in 1959 was divided into seven branch offices, or divisions, each dealing in a particular range of chemical products, namely:

1. Office No 2100—Export and Import of Pharmaceutical Products
2. Office No 2200—Export and Import of Dyestuffs, Auxiliaries and Intermediates
3. Office No 2300—Export and Import of Inorganic Products and Agrochemicals
4. Office No 2400—Export and Import of Organic Products and Fine Chemicals
5. Office No 2500—Export and Import of Rubber, Plastics and Coatings
6. Office No 2600—Export and Import of Coal-Tar Derivatives and Moulded Carbon Products
7. Office No 2700—Export and Import of Photographic Chemical Products

The formation of these separate branch offices, each with a wide independence in trading, not only contributed to the growth of activity of our enterprise, but also brought the office closer to industrial producers and supplier of goods.

Each office (division) has its own branch committee, the members of which are representatives of the branch office and of the industrial suppliers of chemicals dealt in by the office. These members, who are experts either in the technology of production or in selling, discuss and work out all the problems connected with the achievement of the import and export functions of the branch office.

We trust, that this close collaboration with producers of goods will contribute to the establishment of good trading relations with our foreign partners.

THE PROGRESS OF POLAND'S CHEMICAL INDUSTRY

To be adequately based, chemical industry requires only a few crude, naturally occurring raw materials: coal—the principal item—natural gas, petroleum, suphur, salt, limestone, potassium salts and phosphate rock.

Poland's annual output of bituminous coal and lignite amounts to over 100 million tonnes, her salt output being 1.8 million tonnes and that of limestone almost 5 million tonnes. The reserves of these raw materials and of sulphur, already proved in the country, are very considerable.

It is greatly hoped that natural gas, new deposits of which were recently discovered, will be available in adequate quantities. Phosphate rock and petroleum are also produced, although on a limited scale. The amount of petroleum available for chemical processing is not very large, but the quantity required for this purpose can easily be covered by envisaged fuel oil imports. This brief outline of the indigenous raw-material base demonstrates that the exceedingly favourable conditions for the development of Poland's chemical industry are second only to those of the United States and the Soviet Union, and are equal to, or in some cases even better than, those of such countries as the German Federal Republic, Great Britain, France and Italy, with their powerful chemical industries which have a decisive share in the industrial exports of these countries.

It should also be emphasised that even countries which have to import the majority of chemical raw materials (e.g. Czechoslovakia) have for some time been expanding their chemical industries as a result of the ever-growing demand for chemicals. Poland's home demands have greatly stimulated the economic administration—to focus attention on the chemical industry for a number of years and the average rate of growth in Poland's industry, taken as a whole, has systematically been outpaced by that of chemical industry. Nevertheless, until the end of 1957 rapid development of Poland's economy brought about a regular shortage of chemical products and a regular increase in chemical imports; chemical exports were at a relatively modest level. A marked improvement could be noticed in 1958 when imports were maintained at the level of 1957, but the export figure was increased by 41%. This year a further improvement has been recorded because imports have been maintained unchanged, whilst exports have been 20% higher than those of the previous year. In principle, Poland's internal position in chemicals reflects on her external trade in those products. In 1958, home supplies of heavy chemicals fully met domestic demands. Agriculture's needs for fertilisers and insecticides were also covered. Industry did not suffer any shortage of soda, sulphuric acid, methanol, formaldehyde,

pulverisette 1
GERMANY / REG. TRADE-MARK

High Speed Crusher-Grinder
for pulverising small samples for analysis

- Even very hard mineral and ceramic samples (e. g. Corundum, Carborundum, Smelt Cement, Rock, Ores, etc.) or gummy material are pulverised in short time up to approx. 0.1 μ
- Mortar Basin and Pestle are motor driven causing both a grinding and abrasive pulverising effect by means of the pestle operating radially to and fro to the mortar.
- Pulverising pressure may be read and regulated up to 12 kg (= 26 lbs) from outside even during the pulverising process.

pulverisette 1
GERMANY / REG. TRADE-MARK

octagonal mortar 200 m. m. (= 8") outside diameter, with pestle 47 m. m. ⌀ with built-in three-phase gear motor 0.2 kW, 220 or 380 V (special motors on request); cover with Bayonet socket to secure mortar.

Ref. Nr. 100 (D. C. motor)
101 (A. C. motor)

Volume: ~ 750 c. cm. Useful contents: ~ 10 – 20 c. cm. Feeding grain size: < 4 m. m.

Apparatus:
net 90 kg (200 lbs)
measurements: 60 x 35 x 50 cm. (= 24 x 14 x 20")

Wooden box:
gross 140 kg (= 310 lbs)
measurements: 100 x 55 x 80 cm. (= 40 x 22 x 32")

INTERCHANGEABLE PULVERIZING ACCESSORIES

Ref. Nr. of complete grinding set	Type of Material used for pulverizing accessories	Abrasion	Mortar		Pestle		Scraper	
			net gr	Ref. Nr.	net gr	Ref. Nr.	net gr	Ref. Nr.
110	Mortar Hardporcelain Pestle Agate Scraper Agate	strong	3200	1101	300	1102	30	1103
120	Mortar Procorundum (85% Al_2O_3) Pestle Procorundum Scraper Procorundum	medium	3800	1201	650	1202	50	1203
130	Mortar Agate ($Si O_2$) Pestle Agate Scraper Agate	weak	4000	1301	300	1102	30	1103

acetic acid, basic coal derivatives, or dyestuffs. At the same time, the above mentioned products represented the bulk of Poland's exports. In 1959, supplies for industry improved owing to the production of synthetic rubber.

As regards the production level of heavy chemicals, it can be seen, therefore, that Poland ranks among the major producers both in terms of volume and per capita production. She is, however, substantially outpaced in the production of plastics, synthetic fibres, pharmaceuticals, detergents, etc. To illustrate, one could quote nitrogenous fertilisers, production of which amounts to 8.5 kg. per head of population in Poland, near to the per capita figure of the United States, on the other hand Poland's plastics figure was only 1.3 kg. per capita.

Further expansion trends in the Polish chemical industry have been determined as a balance between needs and the country's raw material and investment potentialities. In devising expansion schemes and investment priorities, economic factors were taken into account, priority having been given not entirely to the need to cover home demands, but rather to the costs of production under Poland's economic conditions.

On the basis of these guiding principles, the following targets are envisaged:

1. rapid expansion in the production of plastics and artificial fibres—the prime task of the chemical industry;
2. a further considerable increase in fertilisers;
3. substantial progress in organic chemicals based in coal derivatives, so far not fully taken advantage of, and substantial augmentation of pharmaceuticals capacity in order to cover the ever-growing demands of this country and to improve the structure of chemical exports;
4. substantial growth in the production of consumer articles used by the masses;
5. further advances in heavy chemistry and the mining of chemical raw materials ensuring as far as possible, both Poland's demand for goods from these sources and her traditional exports of them.

By 1965, output of chemicals in terms of value is expected to be two-and-a-half times that of 1958. The production of plastics will be 185,000 tonnes, i.e. 5.6 kg. per capita. The structure of plastics manufacture will be markedly improved, for half of these products will be represented by thermoplastics such as polyvinyl chloride, polystyrene and polyethylene. Large-scale production of the latter is expected to start by the end of the period under review. Poland's present position so far as cellulose fibres are concerned is quite considerable, amounting to 2.3 kg. per capita, or approximately the quantity produced in France or Italy. To a large extent, production is based on cellulose imports and that is why expansion plans refer only to viscose rayon.

All possible efforts will be directed towards a rapid growth of fully synthetic fibre products. So far, Steelon has been the only Polish representative in that group. The production of Steelon will be increased year by year to a level four times that of the present year. Natural gas will help develop the manufacture of wool-like acrylonitrile fibres, whilst coal derivatives will aid the expansion of polyester fibres. In 1965 the production of over 30,000 tons of fully synthetic fibres should make it possible to achieve the planned growth in the consumption of wool and silk without increasing imports of those goods.

By 1965, the output of nitrogenous fertilisers will increase to 480,000 tonnes of pure nitrogen, i.e. a rise of 110% compared with the figure for 1958, thus ensuring application of 30 kg. per hectare of arable land. Owing to the new raw material base, nitrogenous fertilisers can be considered more profitable products not only in the home market but also in terms of exports.

Nitrogenous fertilisers will be accompanied by phosphate fertilisers, mainly in the form of superphosphates based on cheap sulphuric acid and imported apatite and phosphate rock.

Coal tar derivatives and heavy inorganic chemicals have for long been well developed in Poland. It is not surprising that coal derivatives and soda now account for 35% of all chemical exports.

Poland's strong position in inorganic products is expected to be maintained as conditions are exeptionally favourable. Rock salt will help raise the production of soda ash by about 250,000 tonnes, and that of chlorine and caustic soda by about 100,000 tonnes each.

The all-round increase in the productive capacity of sulphuric acid which is to amount to about 500,000 tonnes will be ensured by the use of indigenous sulphur. Cheap sulphuric acid will, in turn, permit expansion in the manufacture of dichromates, aluminium sulphate, lithopone, etc. Expansion in production of inorganic chemicals, salt mining and sulphur mining will make possible increases in exports of soda ash, caustic soda, rock and other salt, and a number of inorganic salts such as the dichromates already mentioned. In 1962, inorganic exports will be enlarged by an important item—sulphur.

As for coal derivatives, the position, especially in exports, is somewhat different. Any further increase in the products is limited by the raw material position which is conditioned both by the output of coal and by coking possibilities. The chemical industry's efforts will therefore be turned toward the economic utilisation of the existing coal-derivative base in order to produce upgraded organic chemicals such as dyestuffs, valuable intermediates (e.g. phthalic anhydride, beta-naphthol, aniline), pharmaceuticals, carbon black, plasticisers, synthetic resins, etc. Thus a spectacular change in the structure of exports will be effected. The quantity of coal derivatives will steadily decrease in favour of a growing quantity of the more valuable organic products. To mention but a few, dyestuffs exports are expected to increase by two-and-a-half times, a threefold growth is envisaged in pharmaceutical exports, whilst those of phthalic anhydride will be higher than the present total production.

Such structural changes will, of course, call for a real effort on the part of both chemical industry and foreign merchanting. The types and grades of dyestuffs and pharmaceuticals available will change considerably with the introduction of new products, and it is realised that competitive conditions will not at once be encountered in foreign markets. The above briefly outlined principal trends in the development of chemistry do not, of course, cover all the tasks that will have to be overcome by the chemical industry in the years to come. It is hoped, however, that the survey will give some idea of the current position and expansion prospects of a basic industrial branch in this country.

Export and Import

OF PHARMACEUTICAL PRODUCTS

The Office of Pharmaceutical Products deals with exports and imports of pharmaceutical products. The Second World War was disastrous to Poland's economic potential. As a result, Polish imports of pharmaceutical products were very large in the immediate postwar period, and included a wide range of products, even basic therapeutics. Reconstruction of the destroyed pharmaceutical industry advanced rapidly so that by 1950 a surplus of pharmaceuticals was available for export. Since 1950, these exports have gradually increased, and a significant rise compared with earlier years was achieved in 1959, e.g. the value of present-day production amounts to 157 per cent of that of 1956.

At present there is still a preponderance of imports over exports, but it is expected that the planned rise of production in the pharmaceutical industry will enable a balance between exports and imports of pharmaceuticals to be reached in the near future.

The present *export range* of this Office includes the following main groups of products:

Salicylates
Sulphonamides
Bismuth compounds
Barbiturates
Pyrazolones
Opium alkaloids
Organotherapeutics
Sera and vaccines

The percentage share of certain items in the pharmaceutical export trade of 1959 was as follows:

1.	Sulphonamides	ab. 30 per cent
2.	Opium alkaloids	ab. 14 per cent
3.	Pyrazolones	ab. 14 per cent
4.	Salicylates	ab. 10 per cent
5.	Organotherapeutics	ab. 7 per cent
6.	Bismuth compounds	ab. 2 per cent
7.	Sera and vaccines	ab. 2 per cent
8.	Barbiturates	ab. 1 per cent
9.	Miscellaneous	ab. 20 per cent

Limitation of exports to the above mentioned chief groups does not mean that the range of the pharmaceutical industry is restricted to those items. Other basic groups of pharmaceutical products such as: antibiotics, glucosides, hormones and vitamins are also produced, but at present their production only covers the needs of the home market. However, since the production potential of the pharmaceutical industry is continuously increasing, it is foreseen that these articles will also be exported in future years.

In the particular export groups listed above we wish to draw attention to the following articles:

Salicylates :
1. Acetylsalicylic acid
2. Sodium salicylate
3. Phenyl salicylate
4. Methyl salicylate

Sulphonamides :
1. Sulphathiazole
2. Sulphanilamide
3. Sulphamethazine
4. Sulphaguanidine

Bismuth compounds :
1. Basic bismuth nitrate
2. Basic bismuth gallate
3. Basic bismuth carbonate

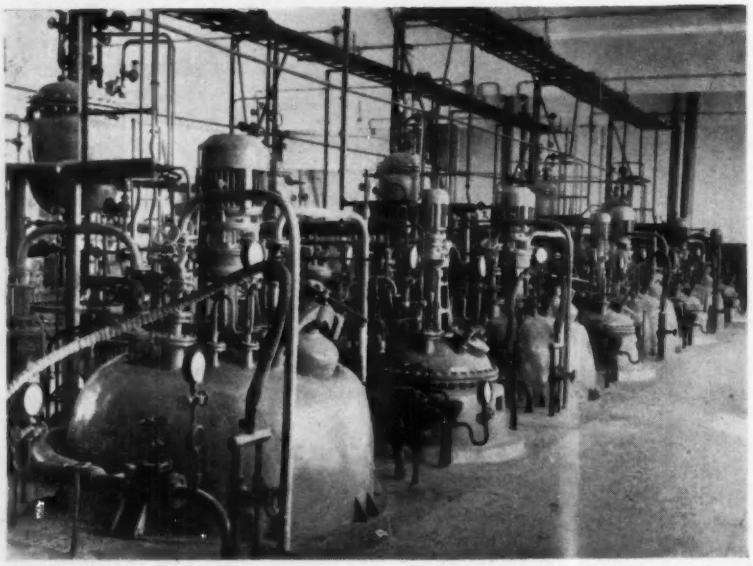
Barbiturates :
1. Phenobarbitone
2. Barbitone
3. Allobarbitone

Pyrazolones :
1. Aminophenazone

Opium alkaloids :
1. Codeine phosphate
2. Codeine

Organotherapeutics : ACTH

Sera and vaccines :
1. Prophylactic vaccines and sera, e.g. antitetanus serum, antidiphtheria serum, antipertussis vaccine, antityphoid vaccine
2. Therapeutic vaccines and sera, e.g. antitetanus and antidiphtheria sera in larger therapeutical doses, Delbet's vaccine
3. Diagnostic agents, e.g. cardiolipine antigen, antigens for evidencing ricketts and tuberculosis.



Pharmaceutical Works in Tarchomin

The quality of the exported pharmaceuticals meets the requirements of both the British and U.S. pharmacopeias.

The sales policy of "Ciech" is to reach the direct consumers, i.e. factories, laboratories and wholesale houses. No efforts are spared to meet the standards of particular markets, since this factor conditions the sale of goods in the importing countries. Owing to this action some articles such as codeine phosphate, sulphanilamide, acetylsalicylic acid have already been adapted to the requirements of Danish and Swedish pharmacopoeia; Phenacetin conforms to Belgian pharmacopoeia; aminophenazone and calcium bromide to Swiss pharmacopoeia.

In the establishments producing for export and in the research institutes, attention is particularly focused on the adaptation of the exported goods to the requirements of foreign customers as well as on the systematic improvement of quality. The pharmaceutical products are exported as substances and in prepared forms (tablets, ampoules and vials). As regards value, exports of substances are far ahead of other articles, substances sold in bulk form constituting 90 per cent of the entire export value. Efforts are, however, being made to increase the proportion of fully prepared drugs, in the first place by widening the range.

As already mentioned, exports of pharmaceuticals show a rising tendency. The growth of exports anticipated in the coming years with 1959 taken as 100 per cent, is given below

1959—100
1960—120
1961—144.5
1965—240

The planned rise in export values will be achieved along two lines:
1. by increasing the quantity exported;
2. by widening the export range

As regards point 2, antibiotics will be added to our export list; it should be mentioned, however, that penicillin has already been exported for a certain period. In addition, several types of vitamins will be offered for export for the first time.

The percentage share of the chief exports in terms of value in 1959 is compared with that planned for 1965.

	1959	1965
Sulphonamides	30.0%	24.0%
Opium alkaloids	14.0%	12.0%
Pyrazolones	14.0%	6.0%
Salicylates	10.0%	11.0%
Organotherapeutics	7.0%	12.0%
Bismuth compounds	2.0%	—
Barbiturates	1.0%	2.0%
Antibiotics	—	20.0%
Vitamins	—	7.0%

The "Polfa" Laboratories supply about 70 per cent of all drugs available on the home market, and about 98 per cent of pharmaceuticals destined

for export. The remaining 2 per cent of exported goods is produced by the "Biomed" Laboratories, manufacturers of sera and vaccines.

The chief suppliers of pharmaceuticals for export are the "Polfa" Laboratories in Starogard near Gdansk (salicylates and sulphonamides), in Pabianice near Lodz (chiefly pyrazolones), in Lodz (bismuth compounds), in Tarchomin (barbiturates), and in Kutno (opium alkaloids).

The production of sera and vaccines is carried out in the "Biomed" Laboratories at Warszawa and Lublin. The sole exporter is the Agency for the export and import of chemicals "Ciech" —Office of Pharmaceutical Products.

Poland already supplies pharmaceuticals to 30 European and overseas countries. It should be emphasised that there are regular customers in Denmark, France, Yugoslavia and Switzerland. As regards overseas countries, the main importers of our pharmaceutical products are: Brazil, the Union of South Africa, India, China and Vietnam.

Commercial transactions on the individual foreign markets are effected by the Commercial Counsellors Offices attached to the Polish diplomatic posts and by agencies collaborating with "Ciech" on a basis of representation contracts.

With a view to promoting export trade "Ciech" participates in numerous international commercial exhibitions such as the International Fairs in Milan, Paris, Ismir, Leipzig and Poznan. Participation in enterprises of this kind provides the opportunity of acquainting wide circles of buyers with our export potentialities.

The development of Poland's pharmaceutical industry is doubtless influenced by the range of imported drugs. At present Poland imports mainly pharmaceutical novelties and therapeutics, the production of which is reserved. The import of these products will have to be continued and the planned balance between exports and imports achieved by substantial increases of exports from year to year. In imports the following groups of drugs predominate: Vitamins, Antitubercular drugs, Newer antibiotics, Corticosteroids, Psychiatric drugs. Notwithstanding the above mentioned products a number of drugs such as: Cytostatics, Analgesics, Soporifics, Antiepileptics, Therapeutics of tubocurarine type, Cardiac drugs, Antidiabetics and others.

Our import contracts are concluded with the most important producers of pharmaceuticals in Europe and in the USA.

ADVERTISER'S ANNOUNCEMENT

(c) PSL brands (union dyestuffs with particularly high fastness)

4. Acid dyestuffs
5. Acid-chrome dyestuffs
6. Basic dyestuffs
7. Sulphur dyestuffs
8. Azoic dyestuffs (Naphtoelans) as well as bases and salts for azoic dyestuffs (Naphtoelan bases and salts)
9. Pologens (dyestuffs of a Neutrogene type developed on the fibre)
10. Vat dyestuffs for dyeing and printing in paste and powder
11. Nigrosines soluble in water, alcohol and fats
12. Special dyestuffs:
    (a) dyestuffs for paper
    (b) dyestuffs for leather
    (c) dyestuffs for wood
    (d) dyestuffs for foods
13. Organic pigments:
    (a) for the production of printing inks
    (b) for the paint and varnish industry
    (c) for rubber products
    (d) for plastics.

Our goods are delivered in excellent export containers in iron drums with special closures, containing from 15-50 kg net according to buyers' requirements and in small tins manufactured in white sheet metal, attractively lacquered in sizes containing 0.5 kg, 1 kg, 2 kg and 5 kg net.

On request we are prepared to give detailed technical information and to supply colour cards illustrating our export range of dyestuffs, their properties and fastness, as well as to send samples and to quote prices.

Export of Polish Auxiliaries

The range of our auxiliary agents offered for export is still modest. However, their high quality, wide possibilities of application and competitive prices attract growing interest on the part of foreign customers.

We offer excellent products for scrooping, wetting, levelling, washing formulations and detergents, products for waterproof impregnation; carbonising agents; and various finishing agents, such as products for improving handle, etc.

Our brochures and samples, which can be obtained on request, give full information on our auxiliary products, among which special attention should be given to

SAPOGEN T and PRETEPON G—anionic wetting, washing, levelling and brightening agents, dispersing lime soaps and preventing their precipitation.

LAWON M, W and FT—anionic scrooping and emulsifying agents of high washing powder.

HYDROFOBOL IW and BX—products for waterproof impregnation of high durability.

NEKALINA S and KARNIT OT—auxiliary agents with good properties especially in dyeing processes.

AWIWAZ BW—auxiliary agent giving full and soft handle to textile goods.

Import of dyestuffs and auxiliary products

Although Poland ranks among those countries possessing important and long established dyestuffs industries, the variety of dyestuffs that we produce is not large enough to prevent us from importing dyes from other countries. Our important and still developing textile industry requires considerable quantities of highly refined dyestuffs which are either not manufactured in our country, or which are not produced in sufficient quantities. Therefore, our import activities should not be underestimated. Each year we spend considerable sums to supply our industry with various essential imported dyestuffs and auxiliary products.

We invite all manufacturers of dyestuffs and auxiliaries to contact our office and we are confident that the business concluded with us either in direct or indirect transactions will be of considerable benefit to our suppliers.

Export and import of dyestuffs intermediates

The production of intermediates for our own dyestuffs synthesis plants as well as for export to other countries has been based on the development of Poland's coke-chemical industry. Our intermediates, due to their high quality and purity, have a good reputation in world markets, and their export sales grow from year to year. Among other items our export list contains the following:

Aniline
Bentanaphthol
Diphenylamine
Dinitrochlorobenzene
Dinitrophenol
Ethyl aniline
Micher's ketone
Anthranilic acid
Betahydroxynaphthoic acid
Metanitroaniline
Orthoanisidine
Orthonitrotoluene
Orthotoluidine
Paranitrochlorobenzene
Salt R

Our intermediates are supplied chiefly to the dyestuffs and pharmaceutical industries.

The competitive prices, resulting from mass production and our own raw material resources, at which we are able to sell intermediates are a favourable factor in the economic production of goods in which they are used.

Please ask for our literature which gives detailed technical characteristics for all our intermediates, and for samples.

Intermediates continue to play an important part in our import plans. Thus, commercial contacts with our office can be of interest not only to those who wish to buy our intermediates, but also for producers and suppliers of this group of goods, especially if there are possibilities of concluding transactions that provide for reciprocal deliveries of intermediates.

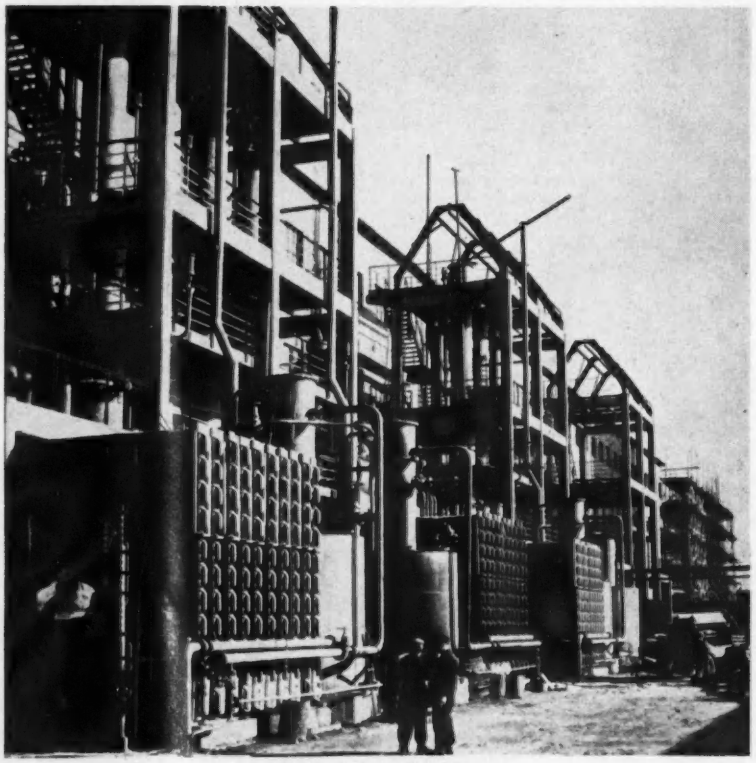
In this short article we want to acquaint all who are interested with the activities of the Office of Dyestuffs, Intermediate and Auxiliary Products and chiefly with the range that we export and import.

We hope that this survey will lead to new commercial contacts of advantage to all partners and that it will serve to further friendly relations between Poland and countries throughout the world.

Office No. 2300 **Ciech**

Export and Import
OF INORGANIC AND AGROCHEMICAL PRODUCTS

The above mentioned office of CIECH, Import and Export of Chemicals Ltd., deals with the export of inorganic chemicals, nitrogenous and phosphatic fertilisers as well as plant protection



Nitrate Plant in Kedzierzyn

Chemical Works in Wizów

agents, manufactured by the Polish chemical industry.

This Office is also responsible for the import of raw materials and inorganic chemicals for the chemical and other industries, as well as of some potassium salts and plant protection agents for agriculture.

Along with Poland's rapidly developing chemical industry, are increases in the production of inorganics, based on rich mineral resources such as coal, salt, calcium, sulphur, etc. The statistics below will give an idea of the rapid development of the Polish inorganic industry.

If we take the production index of 1939 as 1, then production in 1958 and 1965 will be as follows:

	1939	1958	1965*
Soda ash	1	4.2	6.89
Sulphuric acid	1	3.1	6.28
Nitrogenous fertiliser	1	9.6	20.00

* Figures based on estimates.

The percentage increase in production looks as follows:

	in 1958	in 1965
Soda ash	100 %	163 %
Sulphuric acid	100 %	202 %
Chlorine	100 %	350 %
Nitrogenous fertilisers	100 %	202 %

There is great scope for the development of Poland's soda and chlorine industry which is based on enormous resources of salt. In 1965 the output of salt will amount to about 2.4 million tonnes.

The Office of Inorganics and Agrochemicals at present comprises 3 departments: (1) Export of Inorganics, (2) Import of Inorganics, (3) Import and Export of Fertilisers and Plant Protection Agents.

The *export ranges of inorganic products* comprises the following chemicals:

Light soda ash, dense soda ash (introduced for the first time in 1959), caustic soda fused and in flakes, caustic potash fused and in flakes, sodium bicarbonate Venale and DAB 6, sodium thiosulphate Pearle I and II, potassium chlorate, sodium dichromate fused and lump, and, since 1960, also in crystalline form, potassium dichromate, chromium oxide, chromic acid, water glass, calcium chloride, sodium fluorosilicate, sodium fluoride, aluminium sulphate, calcium carbide in various granulations, ammonium bicarbonate, ammonium chloride, sodium sulphite, sodium azide, etc.

Plant protection agents and insecticides:

Azotox based on DDT in various percentages, in powdered or liquid form—ready for spraying.

Tritox (based on DDT, gamma BHC and DMDT),

Ditox L and T (based on dichloro-diphenyl-trichlorethane, techn. BHC),

Fungitox T (based on tetramethylthiuram disulphide),

Fungitox OR (based on mercury phenyl acetate),

Fumatox DG (based on dichloro-diphenyl-trichlorethane and gamma BHC),

Molotox (based on paradichlorbenzene), in tablets,

Metox 30 (based on dimethoxy-diphenyl-trichlorethane),

Orchard Carbolineum (emulsified anthracene oil in water), and other plant protection agents.

The Office of Inorganic and Agrochemicals maintains business relations with 52 countries. Among them are all the European countries. U.S.S.R., German Democratic Republic, Czechoslovakia, Hungary, Yugoslavia, German Federal Republic, Great Britain, France, Denmark, Switzerland, Sweden, Belgium, Finland, Holland, Greece, as well as the overseas ones, e.g., U.S.A., Canada and the South American countries like Brazil, Argentina, Uruguay and Mexico. Besides Egypt, Morocco, the Union of South Africa, Near- and Far-Eastern countries like Syria, Lebanon, Israel, India, Iran, Iraq, Jordan, People's Republic of China, Vietnam People's Republic, North Korea and others. Recently we have started to sell inorganic chemicals to Australia.

The main export items of the Office of Inorganics and Agrochemicals are:

Soda ash: exported to 23 countries, has won markets in the U.S.S.R., Czechoslovakia, Hungary, German Federal Republic, Yugoslavia, Sweden, Denmark, Finland, Switzerland, Greece, Egypt, Syria, Israel, India, Brazil, Argentina, Uruguay, and many other countries.

The following figures give an idea of the steady development of soda ash exporters: in 1958 exports amounted to 147,000 tonnes, while in 1959 they had reached 210,000 tonnes. This puts Poland among the world's chief exporters of soda.

Caustic soda: exported to 11 countries: the U.S.S.R., German Federal Republic, Turkey, Brazil, Argentina, Uruguay, etc.

Sodium bicarbonate: exported to 16 countries: the U.S.S.R., Sweden, Finland, Denmark, Greece, Brazil, Argentina, Uruguay, Mexico, Egypt, Syria, Venezuela and others.

Caustic potash: exported to 20 countries: Great Britain, Denmark, Sweden, Finland, Italy, Yugoslavia, Spain, Austria, Brazil, Mexico, Egypt, India and others.

Sodium dichromate: exported to 16 countries: Great Britain, Austria, German Federal Republic, Denmark, Switzerland, Holland, Belgium, Yugoslavia, Egypt, Uruguay and others.

Calcium carbide: exported to 17 countries: the U.S.S.R., German Democratic Republic, Hungary, Great Britain, German Federal Republic, Austria, Sweden, Greece, Turkey, Egypt, Morocco, India, Iran, Uruguay and others.

Ammonium bicarbonate: exported to 18 countries: Great Britain, German Federal Republic, Belgium, Holland, Yugoslavia, Finland, Brazil, Argentina, Mexico, Egypt, Syria, Israel, India, Indonesia, Iran, Thailand, and others.

In addition large quantities of chemicals, in the

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range already mentioned, are exported to many countries.

Exports of inorganics are steadily increasing. In comparison with the year 1956, they increased in 1958 by 59 % while in 1959 (according to approximations based on concluded contracts) they have exceeded the 1958 export by 25 %.

Irrespective of its export activities, the Office of Inorganics and Agrochemicals also deals with imports of all inorganic compounds which are indispensable to the chemical—and other industries, as well as raw materials for the production of phosphatic fertilisers, potassium salts and plant protection agents.

In spite of the rapid development of the Polish chemical industry and of the fact that every year new products are introduced to the market, the demand for imported inorganic chemicals is great and comprises a wide range of goods, such as:

Raw materials for the production of phosphatic fertilisers, apatites; phosphorites; borocalcite and rosarite; red phosphorus; industrial gases—argon, Freons and others. In addition, phosphoric acid, sodium-, potassium-, barium-, cadmium-, copper-, silver-, tin-, and other cyanides; nickel-, copper-, magnesium-, iron- and other sulphates; cobalt-, silicon-, antimony-, magnesium-, and other oxides; barium peroxide; manganese dioxide; potassium peroxide; calcined potash; magnesium chloride; aluminium chloride; potassium nitrite; sodium nitrite; cryolite; titanium dioxide; precipitated chalk (technical); precipitated chalk (cosmetic); water softening agents; Vulcasil; Wofatit and other washing agents; metal compounds: lithium hydroxide; lithium chloride; lithium carbonate; thorium nitrate; cerium fluoride; cerium oxide; zirconium oxide; tellurium dioxide and others; various catalysts for chemical synthesis, anodes.

Until the exploitation of Poland's rich brimstone minerals can be started on a larger scale, we shall import sublimed and colloidal sulphur. Besides the above mentioned products, we supply agriculture with various types of plant protection agents.

These inorganic products are imported mostly from the U.S.S.R., German Democratic Republic, Czechoslovakia, German Federal Republic, Great Britain, Switzerland, France, Italy, Holland and Belgium. The phosphorites and potassium salts are bought in from German Democratic Republic, Morocco, Jordan and Israel.

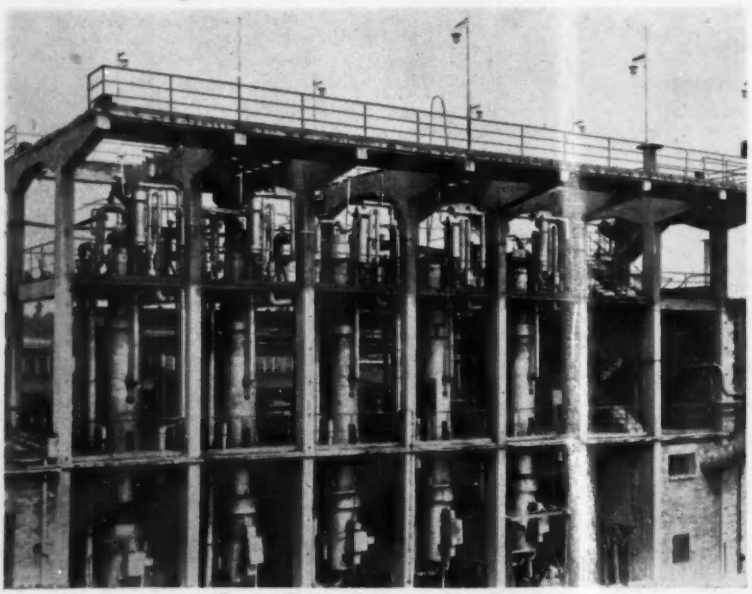
Office No. 2400 **Ciech**

Export and Import

OF ORGANIC PRODUCTS AND FINE CHEMICALS

Our office deals with exports as well as imports of organic products, which may be classified in the following groups:

1. Products of major organic synthesis
   (a) intermediates
   (b) solvents
2. Products of fractionation of pine resin
3. Explosives
4. Cosmetics
5. Essential oils and synthetic aromatics
6. Chemical reagents.



Chemical Works "Rokita" in Brzeg Dolny

This section gives a short description of the particular articles.

Organic intermediates

Acetic acid 98/100 per cent is supplied in carboys and in demijohns of 25 and 55 kg net capacity. We export the product in technical as well as in reagent grade (edible). The number of our regular foreign customers is steadily increasing and production is expanding from year to year, finding ready purchasers in countries of the Near and Far East, in Africa as well as in highly industrialised European countries.

Acetic anhydride 98 per cent has only been exported since last year, but is already highly valued (chiefly by the pharmaceutical industry) in the countries to which it has been supplied. It is available in wicker-protected demijohns of 60 kg net capacity or in carboys.

Methanol formalin, hexamethylenetetramine—these products may be considered as a subdivision of the major synthesis, constituting steps in the improvement of the initial product (i.e. methanol). The importance of this subgroup to modern chemistry is so great, that it is impossible to imagine any, even primitive, production without the use of these products.

The expanding home industry of drugs, plastics and synthetic fibres consumes ever-growing quantities of methanol, formalin and hexamethylenetetramine. The trend to export finished goods instead of intermediates and raw materials, limits exports of the intermediates included in this subdivision.

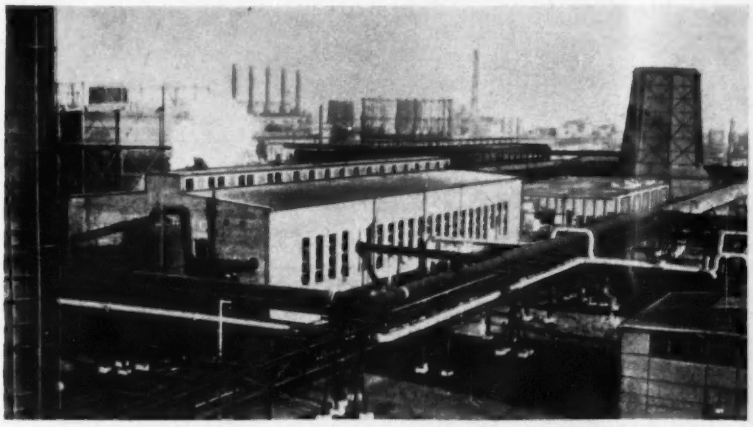
Aniline oil—has a constantly widening range of applications, and the demand for this product increases from year to year. Aniline oil is not only used in the production of dyestuffs and dyestuff intermediates, but is also applied as a starting material in the manufacture of synthetic drugs, and is used in the production of explosives, in the rubber, textile and synthetic resins industries, etc. This product is supplied in carboys and steel drums to European countries (German Federal Republic, Italy, France, Holland, Denmark, Hungary, Bulgaria) as well as to overseas countries. Measures are being taken to meet to a larger extent next year the demands of our regular customers.

Acetanilide—a valuable pharmaceutical intermediate. This year we are able to offer a product of higher grade (powder instead of flake) of guaranteed minimum melting point 112.5°C. We supply this product to Europe (Denmark, France, Great Britain) as well as to overseas countries. We also export *paradichlorobenzene and salicylic acid* to regular customers in various parts of the world.

Urea, technical grade 46.3 per cent is a product in great demand on foreign markets. It has only been exported in the last two years, but owing to its high quality (e.g. water content max. 1.5 per cent) we already have regular buyers in European and overseas countries. We supply this product in multi ply paper sacks, with a bituminous interlayer, protected by jute sacks.

The subgroup of solvents includes the following main items: *monochlorobenzene, ethyl acetate, dichloroethane* and *ethyl ether*. All these liquids are supplied to European buyers in carboys, and to overseas buyers in drums of 115 kg net in the case of ether and about 200 kg net in the case of the remaining solvents. If required, we also supply these products in drums to European customers.

Monochlorobenzene—also used in the production of DDT, is exported in thousands of tons to the German Federal Republic, to Switzerland, Italy and Hungary. It is supplied as well to overseas countries, e.g. Egypt and South America. As regards the remaining solvents, these are regularly exported to the German Federal Republic, Italy, Sweden and Switzerland.



Chemical Plant "Oswiecim" in Oswiecim, General View

Products of fractionation of pine resins

Colophony—a product for many years highly valued by our regular customers in 21 countries in practically all continents. We supply this product in three grades:

3A—very pale colophony, required by the paint and varnish and plastics industries.

WW—pale colophony for similar purposes, and also for the production of soap, waxes and cements.

F—extraction colophony, dark, used in the paper industry. This year we have produced for experimental purposes a small quantity of colophony 5A, palest of all, destined for the manufacture of special paints and lacquers.

Turpentine of balsamic grade is normally supplied in carboys in view of convenience in loading and delivery. We export turpentine to several European countries (Switzerland, German Federal Republic, Yugoslavia etc.) and in smaller quantities to overseas countries.

Explosives

Our export range includes the following blasting explosives, fuses and detonators:

dynamites (rock-blasting grade, waterproof grade, air grade)
ammonites
mining detonating caps Znt and ALP Nr 8
fuses (gunpowder grade and detonating grade)
electric detonators
black gunpowder

Outlets for our exports extend beyond our regular markets to include countries of the Near and Far East.

Cosmetics

We offer the following kinds of high quality toilet soaps: "Uroda" 100 g., "Kora" 100 g., "Savon Ista" 80 g., "Baltyk" 125 g., bath soaps 200 g., baby soaps 100 g. and others.

We have available a large assortment of *perfumes and toilet waters* in a wide range of characteristic persistent scents. To mention some of them:

Perfumes:

"Dla Ciebie"	16 g.
"Amulet"	24 g.
"Rococo"	7 g.
"Sonata"	18 g.
"Bolero"	24 g.

Toilet waters:

"Eau de Pologne"	95/175 g.
"Syrenka"	47/80/181 g.
"Przemyslawka"	23/52/93/135 g.
"Lajkonik"	52/100.5/165 g.
"Polarna"	40/98.5 g.

We also supply triple toilet waters, and particularly popular with men—lavender waters.

We also offer a series of well known *cosmetic creams*, as:

Night creams:

Strawberry cream	45 g.
Honey cream	45 g.
Pineapple cream	45 g.
Lemon cream	50 g.
Egg cream	50 g.

Day creams:

Coldcream	52 g.
Fat cream	50 g.
After-shaving cream	50 g.

All our cosmetics are produced from highest quality domestic and imported raw materials. Packages have original designs, and are aesthetically attractive.

Quantitative and qualitative expansion of exports of *organic products*, and the tendency to supply products of an ever improved quality is not an expression of an aim to be self-sufficient in this field. There are numerous products —both intermediate and finished—the manufacture of which is possible in our circumstances and which has been undertaken in the past. Commercial consultations may, however, sometimes indicate that the production of a certain item or of a whole group is not feasible, and that the item or group should preferably be imported, while some other export production in which we specialise, which gives greater profit, and which has already been introduced in world markets, should be expanded. This is one of the reasons why our office imports, and will for long continue to do so, a wide spectrum of organic intermediates with a view to supplementing our home production. We thus import intermediates such as: butanol; citric, tartaric, nicotinic and formic acids; fatty alcohols; glycols (ethyl, ethylene, diethyl, propylene); glycerine; waxes; oils (tall oil and tung oil).

We also import essential oils and perfumery products for the cosmetics and soap industry as well as laboratory and industrial chemicals.

After this brief review of our export and import ranges it may be useful to mention the home factories which are our suppliers and customers. The complicated processes of organic synthesis have long necessitated construction of plant complexes with various production divisions. For example there are the "Oswiecim" establishments—the highlight of Polish chemistry that are known throughout the world. These establishments are the chief suppliers of products exported by our office, such as: acetic acid, acetic anhydride, methanol, paradichlorobenzene and trichloroethylene. Phthalic anhydride, technical urea and other products are supplied by the Nitrogen Plants of Kedzierzyn. We export numerous products of the Bydgoszcz Chemical Establishments, among which are aniline oil and dinitrotoluene. The expanding Chemical Plant of Rokita in Silesia supplies at present monochlorobenzene and dichloroethane. Smaller specialised factories provide the remaining export items. It is worth noting, that industrial laboratories in Gliwice specialise in the production of chemical reagents.

We hope that this brief outline of the scope of activity of the Office of Organic Products and Laboratory Chemicals, CIECH. as well as the review of our export and import ranges will facilitate the establishment of commercial contacts with our present and future customers.

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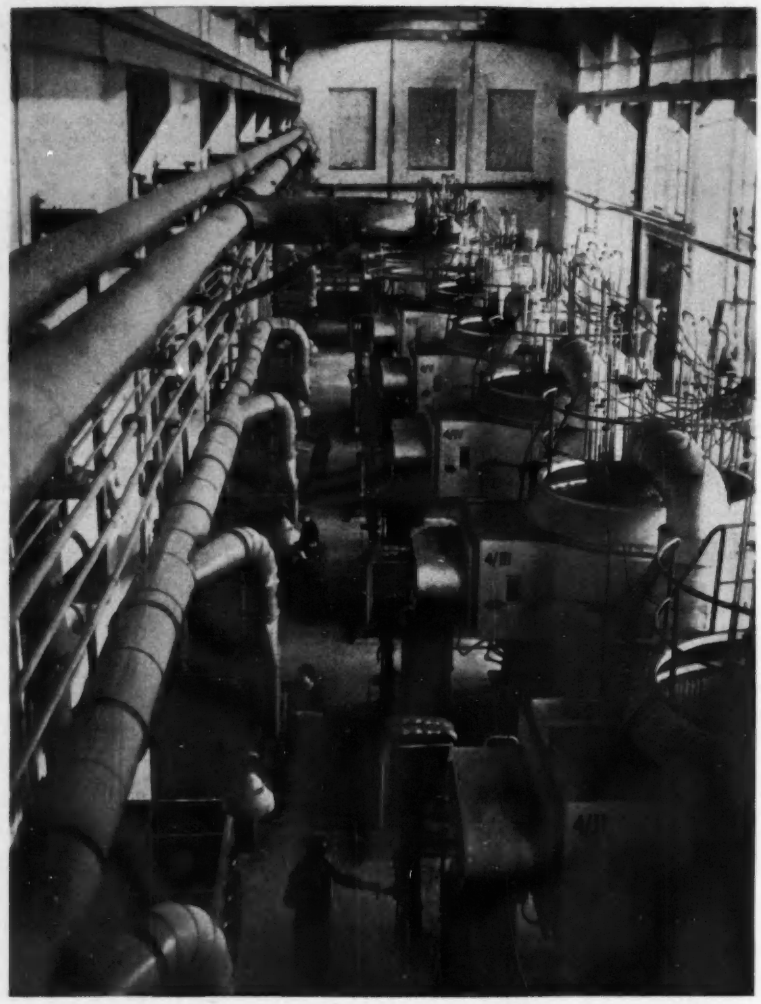


Chemical Plant "Oswiecim", in Oswiecim, Synthetic Rubber Department

1960 some rather considerable quantities for export.

The Polish synthetic rubber, KBS 3012, produced on a styrene-butadiene basis, is a product of the polymerisation of those two components, with phenyl-beta-naphthylamine used as stabiliser. Synthetic rubber KBS 3012, supplied in 100 kg. bales, is used for the production of conveyor belts, cables, and rubber hoses. The tear resistance of Polish synthetic rubber KBS 3012 is min. 200 kg./cm², a remarkable achievement for this type of synthetic.

Plastics and raw materials for their production

Because of the enormous and continually growing requirements for plastics and moulding compounds, domestic production, in some ranges, does not keep step with the needs of the market, while in others some quantities are even available for export.

At present Poland imports the following plastics:

Polyvinyl chloride of various type
Chlorinated polyvinyl chloride
Polystyrene—high impact
Polyvinyl acetate
Polyethylene

and various other plastics as well as some materials for their production.

On the other hand, large-scale output of our industry provides an export surplus *for the following range of plastics* and moulding compounds: *Phenolic laminates "REZOTEXT" and "REZOKART"* available for export in the form of sheets, discs, bearings, rods, tubes, etc.

Textiles and paper impregnated with phenolic resins and submitted to optimum temperature and pressure result in a laminate with high mechanical resistance, good dielectric properties, moisture resistance and easy to machine.

Owing to these properties our laminates are widely used as insulating materials in the machine tool and electrical engineering industries and as structural materials, successfully replacing painted metals. They can also be applied with excellent results for decorative purposes.

Celluloid. This material is exported in the form of sheets in dimensions 750 mm. by 1,500 mm. by 0.2-4 mm., in a range of attractive colours. *Gramophone record compound*—exported in two grades, for the production of long-playing records or for standard records.

Polystyrene. One of the most generally-used moulding compounds, exported in the form of granules in various colours. This material is used in the production of various electrical equipment and for insulation purposes, as well as for domestic utensils, toys, etc.

Plasticisers and rubber auxiliaries

One of the most important items in this group of chemicals—part of the import activities of this Office—is the plasticiser tricresyl phosphate.

This group of chemicals also includes some items that are exported from Poland, namely:

Accelerator "D"—Diphenyl guanidine, a white powder used as universal accelerator in the vulcanisation of rubbers.

Accelerator "T"—also a white powder, used as an ultra-accelerator and weedkiller.

Accelerator "M"—2-Mercaptobenzothiasol, a greyish powder, used also for acceleration of rubber vulcanisation.

Accelerator "P"—extra N—a white powder giving excellent results when used as an ultra-accelerator for vulcanisation.

Stabiliser "AR"—used as stabiliser and antioxidant in the rubber industry.

Natural and synthetic resins

Natural resins, as well as other products, that can be included in the same group of products, such as Shellac, Copal, Damar and Congo Manilla, are regularly included in our import list.

Although the Polish industry has started production of melamine, chloroprene, maleic, polyester and some phthalic resins—synthetic resins are still imported.

The rapid development of our chemical and plastic industries, as well as of all other allied industries, will lead to a decline in the import of some synthetic resins and even to some being added to our export range within the next few years.

In fact, Polish chemistry can now offer for export the synthetic resin *Baltol CG7*, produced on a colophony base and used generally for the production of various types of paints and lacquers.

Paints, lacquers, enamels and materials for their production

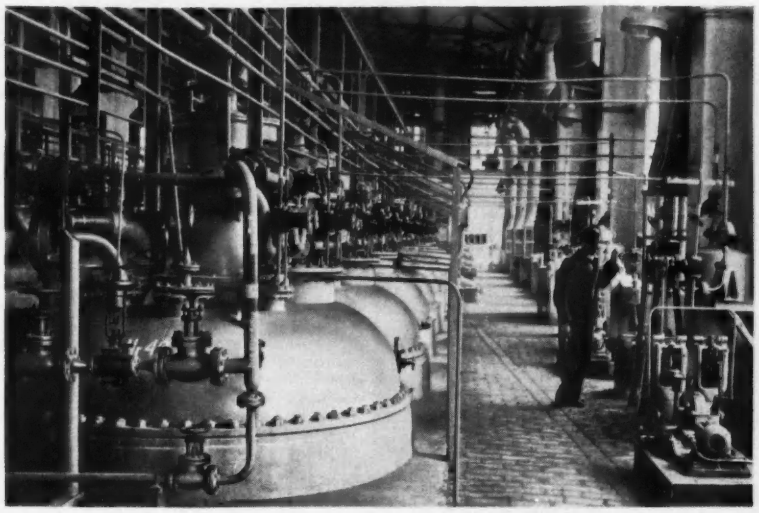
Poland imports some types of electro-insulation, silicone and polyester finishes, as well as stoving enamels and lithographic paints. On the other hand, several high-quality Polish lacquers are being exported to foreign markets with great success. We mention these items in order to acquaint our customers with the range of goods available for export in this branch of chemistry.

Nitrocellulose lacquers and enamels—widely-known, quick-drying lacquers and enamels, based on nitrocellulose.

Colourless nitrocellulose lacquer, used mainly for coating wood and wooden objects, drying to touch in 20 minutes and completely in 45 minutes. Due to excellent resistance to atmospheric effects this lacquer is used for exterior as well as interior finishes. It is also applied as primer under nitrolacquers for a high gloss finish.

Nitrocellulose enamels—in a full range of colours, dry entirely within 45 minutes. These enamels are generally used for coating all kinds of metal surfaces, including cars, motorcycles and bicycles. Some other types of enamels are used for leather finishing. These are also produced and exported in a full range of colours.

Oil paints, lacquers and enamels. These paints are produced on a linseed or tung oil base and are available for export in a full range of colours. These traditional products of our paint and lacquer industry, in spite of strong competition from the modern synthetic finishes, have not lost their position and are still a major item both in production and export, because of their suitability for application on both timber and metal surfaces, excellent covering efficiency and rather good weatherability. Poland's oil-based paints and lacquers have already gained the approval of



Chemical Works in Oswiecim, Rubber Department, Styrene Furnace

foreign customers and are among our regular export lines.

Stove enamels—produced from melamine resins, are the latest products of our lacquer industry. They are applied as finishes for cars, motorcycles, bicycles, refrigerators, washing-machines, domestic apparatus of all kinds, and other metal products. Stove drying at temperature 120-130°C takes 45 minutes. These enamels after drying form a hard, elastic coating, resistant to atmospheric conditions. These properties, as well as the wide range of attractive colours in which they are produced, find ready foreign buyers for our stove enamels.

Synthetic enamels (Syntholux)—based on synthetic resins are one of the latest products of the Polish paint and varnish industry. Customers are very interested in these enamels because of their wide applicability, full range of colours and quick drying. Time required for touch-drying is four hours, for complete drying 12 hours.
It is worth mentioning the latest type of these enamels, namely "Synthorapid", which dries to touch within two hours and is completely dry within six hours.

Further products belonging to this group and being export items are: *chlorinated rubber paints*, remarkable for their excellent anti-corrosion properties; *tropical enamels*, suitable for use in dry and damp climates; *marine paints*—in a wide range of types (for timber and steel vessels); *dry lime wall paints, artists' paints, printing inks* of various kinds and *electrical insulating lacquers*.

Inorganic pigments and materials for the paint and varnish industry

Titanium dioxide is the main product among imported inorganic pigments. But Poland will be a regular exporter of this pigment within the next few years.

Red and yellow iron oxides are also imported, although some types of Polish iron oxides are scheduled for export during 1960.

The following inorganic pigments are exported:
Zinc oxide—one of Poland's traditional exports. Large quantities are sold abroad. In addition to the pharmaceutical and gold seal qualities of zinc oxide, used for special purposes, the material is mainly exported in the three following grades: White seal—containing min. 99.5% ZnO and max. 0.3% PbO. Green seal—containing min. 99.2% ZnO and max. 0.3% PbO. Red seal—containing min. 99.0% ZnO and max. 0.5% PbO. Zinc oxide is the white pigment most frequently used in the paint, varnish, paper, rubber, pharmaceutical and other industries.

The well-known quality of our zinc oxides, swift deliveries, uniformity of product and observation of standard requirements have won our goods many regular and important buyers in European, American, Asian and African countries.

Lithopone—another white inorganic pigment, highly valued by our customers. Produced in two grades, 30% and 60%, it is used mainly in the paint and varnish, paper, plastic, rubber and other industries.

Ultramarine—a traditional inorganic blue pigment, produced and exported in two grades: DTO-I and SAA-II. Uses are in the paint and varnish, sugar, paper, etc., industries.

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Chrome Yellow and *Milori Blue*—these two inorganic pigments, with excellent covering power and fine particle size, find ready buyers on foreign markets.

The most important semi-manufactures for the paint and lacquer industry available for export are:

Nitrocellulose lacquer, based on wood or collodium cellulose, is used for the production of nitro lacquers and enamels. Several types of nitrocellulose of various viscosities are produced by the Polish chemical industry. The most required viscosities are in the range of $^1/_4$-$^1/_2$ sec.

Nitrocellulose chips—pigments produced on a nitrocellulose base, with dibutyl phthalate as a plasticiser. Nitrocellulose chips are used for the production of nitrocellulose lacquers. The chips are pigmented in various colours, making possible the production of nitrocellulose enamels in many colours and shades. In addition, the Polish industry manufactures colourless nitrocellulose chips for the production of colourless nitrolacquers; these have been much appreciated by users.

The products mentioned do not, of course, include the whole of our export range. For example, several thinners, solvents and siccatives are also featured in our export list.

All enquiries regarding our export products will receive detailed replies, and samples, technical literature and other materials will be sent free of charge on request.

Purpose of this short review is to acquaint customers and suppliers with the needs of this Office for imported goods, as well as its export potential.

This information should contribute to an increase in our trade with foreign markets.

Office No. 2600

Ciech

Export and Import
OF COAL-TAR DERIVATIVES AND PRESSED CARBON PRODUCTS

The above Office of CIECH deals with the import and export of coal derivatives and moulded carbon products.
Coal derivatives, manufactured from crude tar and crude benzole, are of key importance in every industrialised country. Several branches of the chemical industry, such as the plastics and synthetic fibres industries, as well as the pharmaceutical and organic industries, are mainly based on coal derivatives. The rapid development of the Polish chemical industry is entailing an ever increasing consumption of coal derivatives. This has led to a change of emphasis in the Polish economy with a proportion of production and sales moving in favour of coal derivatives and a simultaneous decrease in exports of the raw materials and semi-products. This trend will increase, as the home demand for coal derivatives is expanding much faster than their production.
For many years this Office has supplied its products to the countries of the five continents. As is well known, most of these products are exported in the liquid form, being transported in tankers, carboys or drums. The main port of shipment is Szczecin, from which more than 50,000 tonnes of goods are exported each year in tankers.
The products exported by our Office are mentioned below:
Industrial benzole is the main export line in terms of quantity as well as value. It is a mixture of hydrocarbons, mostly aromatic, containing mainly benzene along with smaller quantities of toluene, xylene and further homologues. Industrial benzole is manufactured from crude coke-oven benzole. During the period from November to March "winter" benzole is produced, with the addition of 20% motor gasolene, in order to lower the freezing point, and prevent benzole from solidifying during transport. Freezing would hamper unloading of the merchandise. Among other uses industrial benzole is a suitable fuel for internal combustion engines. It is mostly used in mixture with gasolene and alcohol. Industrial benzole greatly improves the octane rating, and is therefore used to upgrade low-octane petrols. Main buyers of industrial

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benzole are the U.S.A. and the German Federal Republic.

The most important buyers of *pure benzene* are: Italy, France, Federal Republic of Germany, and Great Britain.

Benzene is transported mainly in tankers (500 tonne loading) or in rail tankcars (15 and 30 tonne lots), and galvanised iron drums (of about 180 kilos net).

Due to the high freezing point of benzene all forms of transport and containers are supplied with heating units, particularly during winter.

Toluene—an ideal solvent for many organic substances and an important raw material for several chemical syntheses—has for many years been exported by this Office.

The main buyers are: Sweden, Switzerland, Denmark and Austria. Toluene is supplied to these countries in rail tankcars, while to overseas destinations it is shipped in tankers or galvanised iron drums.

Owing to increased capacity for *synthetic phenol*, some quantities of this item have this year been earmarked for export. Next year we shall export several thousand tons.

Phenol is used in the chemical industry mainly for the production of plastics and for the synthesis of many organic products.

In the pharmaceutical and dyestuffs industry phenol is used for the production of many medicines and dyestuffs.

Phenol is supplied in galvanised or stainless-steel drums, provided with heating units. Small quantities are shipped in sealed drums constructed of tinned or galvanised plate.

In connection with the rapid development, all over the world, of phthalic anhydride production, a large demand has arisen for *pressed naphthalene*. Each year we export pressed naphthalene to many European countries, as well as to the U.S.A., Japan and most recently to Australia.

Other grades of naphthalene are also exported, e.g. sublimated naphthalene in flakes, naphthalene in ball form and crystals. The first two types are mostly supplied to the Near East, Africa and Canada, while the crystalline product goes to many European countries.

An important role in the exports of this Office is played by *coal tar pitch* 65/75°C, supplied to a number of European countries, up to a total of 15,000 tonnes a year (mostly loose in ship loads).

Due to its basic properties, i.e. great viscosity and relative easy hardening as well as an excellent resistance to water, it is used for the production of bitumastic compounds for use in construction, being at the same time a binding material and an insulant against moisture. It is also used in the briquetting of coal and for the production of roofing felt.

Pitch coke is another bulk export item. It is widely used in the production of carbon electrodes (both for metallurgy and carbide production), graphite electrodes, carbon linings, anodes, lamp and battery electrodes and other small articles; it is in good demand and imported by many industrialised countries.

Pitch coke is mainly transported in open rail coal-cars.

In addition to the quantities of pitch coke used by the home market, the Office also exports each year about 10,000 tonnes.

Among further coal derivative products exported are: *pure pyridine* (2°C), as a valuable raw material for the chemical industry, mainly for the production of pharmaceuticals.

Pyridine bases, with a low boiling point, used to denature alcohol, as well as a raw material in the production of auxiliaries for leather and textiles finishing, for insecticides, disinfectants, and vulcanisation accelerators.

Anthracene 50-55%, a raw material for the production of anthraquinone, printing inks, stabilisers, liquid fuels for engines, synthetic tanning extracts, etc.

Lutidine fractions—used as solvents for purifying indigo and anthracene.

A separate item in the export range of the Office is *carbon black*, of which several thousand tonnes are exported each year. Besides European countries our carbon black is sold to South America and the Near East.

Polish carbon black is used with advantage by buyers in the rubber industry as a filler, improving the elasticity and abrasion resistance of rubber products. It is also used for the production of ebonite, black varnishes, printing inks, explosives, etc.

We export straight and granulated carbon black, similar to the German grades CK_3 and CK_4.

Rapid development of our rubber industry in forcing the Office to import several other grades of carbon black, in addition to those produced in Poland, viz.: semi-active, non-active and highly dispersed carbon blacks.

Besides coal derivatives this Office exports several *moulded carbon* products, including mainly *carbon electrodes*.

Development of the electrothermal industry has necessitated producing high-quality carbon electrodes, having good electric conduction together with high strength and good resistance to high temperatures.

Electrothermal processes involving chemical reactions (production of carbide and high-quality steels) call for the use of carbon electrodes ZEW. They possess valuable physico-chemical properties, burn evenly and slowly in electric furnaces, have a low specific electric resistance—and therefore good electric conduction—as well as a high strength. They are made of high-quality raw materials, such as special anthracite, special grades of coke and graphite with the addition of a bitumin binder.

After grinding the raw materials, special blends are made according to buyers' wishes for given types of electrodes.

Taking into consideration the varying construction of electric furnaces, we manufacture carbon electrodes. We export carbide, carbon electrodes EWK and metallurgical carbon electrodes EWH. Among our European buyers the most important is Sweden, while among overseas customers—Brazil.

For many years this Office has exported to a number of countries *battery electrodes ZEW, lamp electrodes for cinematograph projectors and lamp electrodes for reproduction and copying*.

Small carbon articles, like ZEW-brush plates and brushes for electric apparatus, well known for their quality, are in wide demand among buyers. Carbon masses of various types are traditional Polish export items. Manufactured from crushed high-quality material and hot-mixed with bitumin binder, they are used as self-burning continuous electrodes, as well as a material for building up furnaces and other industrial items; several thousand tonnes are exported each year.

Several grades of *furnace linings ZEW* are exported for use in the metallurgical industry, for the production of non-ferrous metals by thermoelectrolysis and for the lining of electric furnaces.

Buyers are supplied with acid-resistant cements ZEW, for the jointing of linings, as well as other small carbon products used in various industrial installations.

Activated carbon—Carbopol—is another product that is exported to many European and overseas countries.

Manufactured from high-quality organic raw material it is of high purity, is easy to handle and very selective. Decolorising with Carbopol does not involve any chemical change. Elimination of various impurities is due purely to the physical properties of Carbopol.

Activated carbon is in demand in many countries, due to its many uses in the sugar, fat, chemical, pharmaceutical, foodstuff and other industries.

Office No. 2700

Ciech

Export and Import

OF PHOTOCHEMICAL PRODUCTS

The Office of Photochemical Products deals with exports of "Foton" brand products, particularly cine film, miniature and roll films, X-ray diagnostic film, photographic paper and photographic chemicals.

The Office of Photochemical Products also handles imports of raw materials for the photochemical industry as well as finished products, which are either not produced by the home industry or which are indispensable qualitatively or quantitatively to Polish production.

Photochemicals are produced in Poland in several laboratories, which have prewar connections, and products bearing the trade name "Foton" are highly valued in other countries.

Below is a general description of the chief groups of the export products of the Polish photochemical industry:

Fine-grained positive cine film

The positive film "Foton" is designed to produce high-quality pictures and excellent sound. The positive film is supplied in sections of 305 m. length and 35 mm. width with standard positive perforation, and of 32 mm. width (coupled 2 × 16) with one-side or two-side standard perforation.

Miniature films

Fotopan F. Universal panchromatic, fine-grained, high speed miniature film used in varying conditions of light, particularly where faithful reproduction of small detail or big enlargements are required.

Exposure as for:

ASA	DIN	BSI (log)	Sch.	Weston
40	18/10	27	29	32

Fotopan super. High speed, panchromatic film, fine-grained for a film of this speed, specially suitable for poor lighting conditions or in cases where exposure times are required to be as short as possible.

Exposure as for:

ASA	DIN	BSI (log)	Sch.	Weston
80	21/10	30	32	64

Miniature films are supplied in cartridges with refills of 36 and 20 exposures, in the form of daylight refills (without cartridges) or dark-room refills. They are also available in sections of 17 m. (or 10 × 1.7 m.).

Roll films

Fotopan F. Universal, fine-grained, panchromatic roll film of high speed for varying lighting conditions, particularly where faithful reproduction of fine detail or big enlargements are required.

Exposure as for:

ASA	DIN	BSI (log)	Sch.	Weston
40	18/10	27	29	32

Fotopan Super. High-speed, panchromatic roll film, fine-grained as for a film of this speed, specially suitable for poor lighting conditions or in cases where exposure times should be as short as possible.

Exposure as for:

ASA	DIN	BSI (log)	Sch.	Weston
80	21/10	30	32	64

Roll films are supplied in standard and tropical qualities (the tropical quality has specially treated emulsion and is hermetically packed) on spools 120, 620 and 127.

X-ray routine diagnostic film

The "Foton" X-ray films are characterised by excellent contrast and definition of picture. They are mainly designed for use with supporting foils, but may also be used without.

X-ray films are supplied in all standard sizes in unit packings of 25 or 75.

Photographic papers

Contact paper

Chlor. Chloride paper for amateur and professional blue-black contact prints. "Chlor" papers are produced with four kinds of paper supports:

C 111 C—thin, blue-white, glossy, smooth
C 221 C—thin, white, semi-mat, smooth
C 511 C—thin, cream-coloured, mat, smooth
C 231 C—thin, white mat, smooth

in six contrast grades:

50°—soft
50°—special
42°—normal
34°—hard
26°—very hard
18°—extra hard

Contact paper for portrait work and projection paper

Chlor B. Chlor-bromide paper for portrait and studio work, giving warm black-brown prints.

"Chlor B" papers are produced on ten kinds of paper supports:

Foton Ciné Film Packed for Export

CB—221 K—white card, semi-mat, smooth
CB—222 K—white card, semi-mat, fine-grained
CB—225 K—white card, semi-mat, silky
CB—231 K—white card, mat, smooth
CB—232 K—white card, mat, fine-grained
CB—521 K—cream - coloured card, semi - mat, smooth
CB—522 K—cream-coloured card, semi-mat, fine-grained
CB—525 K—cream-coloured card, semi-mat, silky
CB—531 K—cream-coloured card, mat, smooth
CB—532 K—cream - coloured card, mat, fine-grained

in three contrast grades:

58°—soft
50°—special
42°—normal

Portrait-Rapid. Bromide projection paper for big enlargements, used in studio and portrait work, gives sepia prints. The "Portrait-Rapid" papers are produced with the same types of paper supports as papers "Chlor B" in two contrast grades: normal (42°) and hard (34°).

Projection papers

Brom. Bromide papers for amateur and professional enlargements.

"Brom" papers are produced with fourteen kinds of paper supports:

B—111—C—thin, blue-white, glossy, smooth
B—111—K—blue-white card, glossy, smooth
B—221—C—thin, white, semi-mat, smooth
B—221—K—white card, semi-mat, smooth
B—222—K—white card, semi-mat, fine-grained
B—225—K—white card, semi-mat, silky
B—531—C—thin, cream-coloured, mat, smooth
B—231—K—white card, mat, smooth
B—232—K—white card, mat, fine-grained
B—521—K—cream - coloured card, semi - mat, smooth
B—522—K—cream-coloured card, semi-mat, fine-grained
B—531—K—cream-coloured card, mat, smooth
B—532—K—cream-coloured card, mat, fine-grained
B—525—K—cream - coloured, semi-mat, fine - grained

in five contrast grades:

58°—soft
50°—special
42°—normal
34°—hard

Photographic papers "Foton" are supplied in all standard sizes.

Overseas News

(*Continued from p. 766*)

Epoxy plastics based on epoxide-207 can withstand temperatures in excess of 507°F. The lowest viscosity diepoxide now commercially available is claimed to be epoxide-206. Its viscosity is almost as low as that of water.

Polymerisation of *epsilon*-caprolactone is the basis of a variety of viscous liquid polyesters that hold promise for the manufacture of urethane elastomers.

Montecatini Plan Fertiliser Plant in Sicily

Montecatini are planning to set up a new plant for the production of fertilisers at Porto Empedocle in Sicily.

Shell Plan 80 m. Lb. Polypropylene Plant in U.S.

Shell Chemical are to start construction in the middle of next year of an 80 million lb./year polypropylene plant near Woodbury, N.J. Completion is scheduled for 1962. A Shell Development process will be utilised.

New Russian Catalytic Reforming Plants

New catalytic reforming plants with the name Lengiprogas have been designed in the U.S.S.R., each unit having a throughput of 300,000 tonnes/year. One version uses straight-run benzene in the fraction groups 62-85°C or 62-105°C to produce benzole or toluol. It incorporates three reactors and one hydrogenation reactor. Pressure in the third reactor is given as 20 atm. and catalyst regeneration is every 6-8 weeks.

Another version of the plant produces benzole from 60-85°C fractions and high-octane ligroin from 85-105°C fractions and likewise incorporates three reactors and one hydrogenation reactor, the latter being for benzole production.

Dow Glycerol Explosion Kills Five

An explosion at the glycerol plant, Freeport, Tex, of Dow Chemical was responsible for the deaths of five operators and for injuries to 14 others. Second explosion at the plant this year, damage is put at $100,000. Cause is believed to have been a leak in a vapour feed line carrying a mixture of allyl chloride and propylene chloride to a distillation column.

Natta Work on Polymerisation with Metallic Amides

In a recent edition of *Chim. e Ind.* (42, 1960) G. Natta and colleagues have published a paper on the polymerisation of ethylene, propylene, acrylate and methacrylate with metallic amides. The amides concerned are: Li-N-carbazyl; N - diphenyl - amide - Mg - bromide; N-diethyl-amide-Mg-bromide; Be-bis (N-diphenyl-amide; Al-tris (N-diethyl-amide); and Al-tris (N-diphenyl-amide).

In polymerisation they play the role of metallic-organic compounds. When polymerisation of ethylene and propylene is carried out with complex catalysts made up of Ti-halogenides and metallic amides, crystalline polymers in the case of ethylene and crystalline-isotactic polymers in the case of propylene are yielded. Crystalline-isotactic polymers are produced from the polymerisation of acrylates and methyl-methacrylate with pure metallic amides.

New U.S. Facilities for T.D.I., Sodium Chlorate

Current U.S. expansion projects include the raising of tolylene diisocyanate capacity of Mobay at New Martinsville, W.Va., by 15 million lb. to 40 million lb./year. Stauffer Chemical are now producing ultra-pure titanium trichloride at their new 500,000 lb./year Anderson Chemical Division plant at Weston, Mich. Hooker Chemical have their fourth expansion in hand for sodium chlorate capacity at Columbus, Miss. Monsanto Chemical are in commercial production of polymeric plasticiser, Santiciser 409, at a new plant at Everett, Mass.

S.B.A. Get Contract for French Styrene Plant

A plant with a capacity to produce 25,000-30,000 tons/year of styrene is to be designed and built by Société Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.) of Liège, Belgium, for Ethyle-Synthèse. This unit will be installed at Lillebonne, Seine-Maritime, France, and will apply the process of Koppers Co. Inc., U.S.

S.B.A. have already erected a first styrene unit for Ethyl-Synthèse at Mazingarbe, Pas-de-Calais, France, and was also entrused, in 1959, with an extension for this unit. Altogether, five styrene plants using the Koppers process have been designed and constructed by S.B.A. in Europe.

First of Three Carbon Black Units on Stream in Italy

Italian rubber, plastics, paints, etc., industries use between 35,000 to 40,000 tonnes of carbon black a year. This figure, however, is bound to grow during the next few years. Until very recently Italy imported all its needs for carbon black, but Cabot Italiana have inaugurated their new plant at Ravenna with an initial output scheduled at 15,000 tonnes a year.

Two other plants are at present being built in Italy. One will be operated by Phillips Carbon Black Italiana, in whom ANIC (E.N.I. Group) hold a 30% interest and an option for a further 20%. This plant is being built at Ravenna and initial output will be 12,000 tonnes/year. The other plant is being erected at Fregate, near Novara, by Columbian Continental European. Yearly output is scheduled at 27,000 tonnes.

All the three plants will be based on petroleum feedstock. There are two very small plants in Italy (Cledca and Distillerie Lombarde) both of which use tar by-products, to produce about 2,000 tonnes a year of carbon black suitable for the paint industry.

U.S. to Get Fourth Saline Water Conversion Plant

The Federal Government has asked for the assistance of Struthers Wells Corporation of Warren, Pa., in determining the best design for the saline water conversion plant to be built at Roswell, New Mexico. The country's fourth water conversion plant, it will employ the forced-circulation vapour compression distillation process. The plant will be designed to produce fresh water from brackish water at the rate of 250,000 to 1 million gall./day.

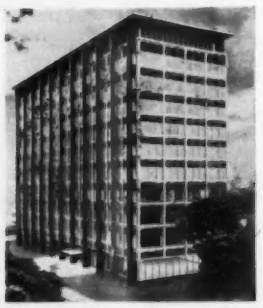
Struthers Wells, who recently developed their own separation process through controlled freezing, will lend experimental equipment to the project, such as a forced circulation test evaporator, as well as the services of its engineering staff headed by Dr. Hans Svanoe.

At present, the Office of Saline Water is considering a proposal from Struthers Wells and Scientific Design Inc. of New York for building of a pilot plant which would use the Struthers Wells freezing process to convert sea water to fresh water.

Greek Polystyrene Plant for Dow Chemical

Dow Hellenic Chemical Industry, a wholly-owned subsidiary of Dow Chemical, Midland, Mich, are constructing a polystyrene plant at Lavrion, a suburb of Athens. Completion is due late next year and the main contractors are Foster Wheeler Italiana, Milan.

UNION CARBIDE OFFICES, CANADA



A new landmark in Toronto, completed by Anglin-Norcross Corporation, Canadian associates of Holland and Hannen and Cubitts Ltd., is this 11-storey black and silver office building for Union Carbide Canada Ltd. Built at a cost of £1.8 million, it is believed to have the largest span of any office building in the world, with interior dimensions of 210 ft. by 61 ft. It incorporates the largest amount of stainless steel curtain wall construction in Canada. Occupying an entire block, it has a car park for 235 cars. Some 450 Union Carbide employees work on the upper seven floors

PEOPLE in the news

● Following on their move to new and larger office and warehouse premises at Windsor Works, Venn Street, Clapham, London S.W.4, Foster Brothers (London) Ltd., the London subsidiary of Foster Brothers Ltd., Wednesbury, have made organisational changes. Owing to advancing years **Mr. A. T. Ayers** is shortly retiring from the board and his place will be taken by **Mr. J. S. Derek Ayers,** who is the son of the managing director, **Mr. J. A. Ayers. Mr. J. H. Watson,** who has been connected with the tube trade for some 25 years, has joined the sales staff.

● **Mr. J. K. Benson,** a director of York Shipley Ltd., refrigeration engineers, North Circular Road, London N.W.2, has retired after 31 years of service. He joined the board in 1938 and since then has been responsible for the company's financial affairs.

● **Dr. Rudolf Schmidt,** a director of the Berlin chemical concern Schering AG, has been re-elected president of the Verband der Chemischen Industrie, Frankfurt-on-Main, for a further year of office. **Dr. Carl Wurster,** chairman of Badische Anilin- und Soda-Fabrik AG, Ludwigshafen-on-Rhine, has been elected vice-president.

● **Dr. B. Spencer,** senior lecturer at the University College of South Wales, has been apointed to the newly created chair of biochemistry at Dublin University.

● **Dr. M. Josephs, B.Sc., Ph.D., A.R.I.C.,** has been appointed market research manager of Price's (Bromborough) Ltd., a newly created post aimed at furthering the company's interest in the oleochemical field. From 1948 to 1955 Dr. Josephs was at Bristol University and carried out post-graduate research on heterogeneous catalysis. In 1955 he joined the research department of Unilever Ltd., working on synthetic detergents. From 1957 to 1960 he was with John Knight Ltd., of Silvertown, as research and development manager, covering the field of glues, adhesives and fats.

M. Josephs

T. C. Black

● **Mr. T. C. Black, M.P.S.,** general manager of the Ames Company Division of Miles Laboratories Ltd. since March 1959, has been appointed a director of Miles Laboratories. He will have special responsibilities for Ames Company Division operations in the eastern hemisphere. Born in Melbourne and educated in England, Mr. Black spent 27 years with Menley and James Ltd. and for the last six years was a director. In 1956 he joined Pfizer Ltd. as commercial development manager and was responsible for seeking new products in the ethical and proprietary pharmaceutical, animal feed supplement, animal health, food preservation and crop protection fields.

● **Professor Dr. Karl Krejci-Graf,** Frankfurt-on-Main, has been awarded the Carl Engler Medal of the German carbon chemicals association Deutsche Gesellschaft für Mineralölwissenschaft und Kohlechemie, for work in mineral oil. The association, which met in Frankfurt this month, elected **Dr. Günther Schlicht,** Hamburg, as president in succession to **Professor Dr. A. Bentz.**

● **Dr. Robert H. Marriott, D.Sc., F.R.I.C.,** director of product research at County Laboratories Ltd., who, as announced last week, has retired from the company after 20 years' service, has achieved international recognition for his work in cosmetic science and biology of skin and hair. Dr. Marriott began his distinguished career in 1921, serving with the British Leather Manufacturers' Research Association for 14 years. He joined the Yorkshire Dyeware and Chemical Co. in 1935 and in 1940 began his association with County Laboratories Ltd., first as chief chemist. After the war Dr. Marriott joined the board at Beecham Research Laboratories, Brockham Park, Surrey, and in 1949 he returned to County to take charge of the laboratories there. On 29 November, Dr. Marriott will attend the annual meeting of the U.S. Society of Cosmetic Chemists to receive the 'medal award' for outstanding service in the field of cosmetic science. His successor at County Laboratories will be **Mr. C. Pugh, B.Sc., F.R.I.C.,** product research manager, who has been with the Beecham Group for six years.

● **Mr. H. I. S. Catherwood, M.A.,** is joining Sigmund Pumps Ltd. on 1 November as sales director. He succeeds **Mr. H. P. Lord,** who has been appointed managing director of International Boilers and Radiators, a sister company in the Bookers Group. Mr. Lord will continue to be a director of Sigmund Pumps.

● **Mr. L. Coltman,** formerly of Insulators Ltd., has joined the board of Moto Plastics Ltd., Gateshead. Moto Plastics will shortly be moving into a new and larger factory at Ponteland, near Newcastle Airport.

● **Dr. S. English, F.Inst.P.,** who retired from all executive work for the company on 31 December 1959, relinquished the post of chairman of Holophane Ltd., glassware manufacturers, on 30 September, but is remaining on the board. He is succeeded as chairman by **Mr. H. G. Campbell, T.D. M.A.,** who has been a director of the company for five years.

● **Mr. J. Marcus Harrison, A.R.I.C.,** chief chemist of Walker and Martin Ltd., Bolton, was elected president of the Society of Leather Trades' Chemists, at the recent annual meeting. He has been with the company for 34 years.

● **Dr. Chris A. Stiegman** and **Mr. Charles C. Hornbostel** have been elected new vice-presidents of Hooker Chemical Corporation. Dr. Stiegman is now vice-president research and development, and Mr. Hornbostel is vice-president finance. Including service with the former Oldbury Electro-Chemical Co., now merged into Hooker, Dr. Stiegman has been with the corporation for 23 years.

C. J. Smith, manager of the filter division of Eimico. See C.A., 29 October

● **Mr. H. P. Barker, M.I.Gas E., M.I.E.E., M.I.Mech.E.,** chairman and managing director of Parkinson Cowan Ltd., was elected chairman of the British Institute of Management at the annual meeting on 18 October.

● **Mr. R. Chappell** has been released from his engagements with Fred Chappell Ltd., Liquid Fertilizers Ltd. and Cross Bone Fertilizers by mutual agreement with the parent company, Hargreaves (Leeds) Ltd.

● **Mr. R. D. Millar,** managing director, and **Mr. Graham Walmesley,** chief chemist of Aeropreen Ltd., High Wycombe, flew to New York last week for a 14-day tour of chemical and engineering factories, polyether foam producers and fabricators in the U.S. They were joined a few days later by **Mr. R. V. Grinstin,** chairman of Aeropreen.

Will

Mr. John McNay Rimington, managing director of the Chemical Division of the Distillers Co. Ltd., who died on 19 June, left £15,967 net (duty paid £677).

Commercial News

- £4½m. Gross Profit for Fisons Group
- Union Carbide Investments total $200 m.
- Howards Talks Ended by Mutual Consent
- Crookes Recommend Guinness Offer

Fisons Ltd.

Group sales of Fisons Ltd. in the year ended 30 June totalled £51,343,000 (£46,688,000). Group profit before tax was £4,509,000 (£3,641,000); the figures are not comparable, however, due to accounting changes regarding the past service pension fund and depreciation. On a comparable basis the increase in trading profit is about £1,170,000.

Tax takes a larger share of the profit; the increased rate of profits tax (up 2½% to 12½%) will be levied on the profits of the last three months of the year. If the higher rate had been in force for the whole of the year, the tax charge would have been some £80,000 greater. A final dividend of 7% is recommended on ordinary, making 11%.

In his annual report, Sir Clavering Fison, chairman, spoke of the organisational changes effected on 1 January. The executive functions of the board of Fisons Ltd., now a holding company, are exercised through the two managing directors, Mr. J. W. Napier and Mr. A. Wormald, who are responsible for carrying out the policies and decisions of the board (see also p. 760).

Union Carbide

Union Carbide state that over the current year investments will total over $200 million ($236 million). Over the first three-quarters of this year, as compared with the corresponding 1959 period, the company's net profit has totalled $117,400,00 ($127 million) or $3.90 ($4.22) per share. In the third quarter alone sales totalled $385,900,000 ($360,800,000) and net profit some $36,200,000 ($36,600,000).

Howards and Sons

Directors of Howards and Sons Ltd. state that negotiations following the approach made in the summer have now been terminated by mutual consent without an offer being made for the company's ordinary stock. Last week it was stated that an announcement would be made before the end of October in connection with the merger talks.

Although interim results for the first half of the company's year which closed on 31 October will not be available until December, it is stated that profits are running well above last year's level. Prospects continue to be encouraging and the directors expect to be able to declare an interim dividend of not less than 7% (for the previous 16-month period there was an interim of 4% and a final of 10%).

Crookes Laboratories

Directors of Crookes Laboratories Ltd. are recommending shareholders to accept an offer of 20s for each of the 1,200,000 5s shares which is to be made jointly by Arthur Guinness and Son and Philips Electrical Industries. The directors intend to accept in respect of their own shares. Crookes' Park Royal works produce ethical products, including auro-calcium and neoferrum; a substantial part of turnover is in halibut and other fish liver oils.

Guinness, with their acquisitions in the confectionery field—Callard and Bowser, Wm. Nuttalls and Lavells—have been divertifying. They have recently opened new research laboratories at Park Royal. It is thought Guinness will be the major partner in the venture. Philips, are the U.K. subsidiary of Philips Lamp Works, Eindhoven; the group already has large pharmaceutical interests—Philips Duphar.

Hercules Powder Co.

The Hercules Powder Co. announces a net profit for the third quarter of 1960 of $850,000 dollars and a turnover of $88,836,000 ($710,000 and $73,089,000). Over the first months of 1960, as compared with January-September 1959, net profit totalled $2,360,000 ($2,070,000) and turnover $249,333,000 ($210,289,000).

NEW COMPANIES

ACROB CHEMICAL PROCESSORS LTD. Cap. £1,000. Consultants and specialists in chemical process engineering, etc. Directors: J. P. Robinson, A. C. Rodger and N. W. Keyworth. Reg. office: Trent Works, Derby Street, Burton-on-Trent.

LECHYL LTD. Cap. £100. Manufacturers of and dealers in chemicals, plastics and synthetic materials, soaps, detergents, washing powders, cleansers, polishes, paints, distempers, varnishes, lubricants and chemical compounds, also packages, cartons and containers, etc. Solicitors: Howe & Lake, 22 Chancery Lane, London W.C.2.

POLYDON LTD. Cap. £100. Manufacturers, importers and exporters of and dealers in chemical, pharmaceutical, medicinal, industrial and other scientific preparations, etc. Directors: J. Pomeraniec and S. Majaro. Reg. office: 1 Avery Row, London W.1.

MICRO-ORGANICS CO. LTD. Capital £500. Manufacturers of and dealers in foodstuffs and fertilisers. Directors: G. A. Hills, H. J. Polder. Reg. office: 64 North Walls, Winchester, Hants.

INCREASES OF CAPITAL

HENRY W. PEABODY (INDUSTRIAL) LTD., manufacturers of and dealers in detergents, oils, chemicals, etc., 16 Byward Street, London E.C.3. Increased by £35,000, beyond the registered capital of £40,000.

UNION OXIDE AND CHEMICAL CO. LTD., 37 Mincing Lane, London E.C.3. Increased by £25,000 in £1 ordinary shares, beyond the registered capital of £75,000.

GALLWEY CHEMICAL CO. LTD., 356/68 Evelyn Street, London S.E.8. Increased by £20,000 in 6,500 ordinary shares of £1 and 54,000 A ordinary shares of 5s each beyond the registered capital of £5,000.

Market Reports

7½% PRICE REDUCTION FOR ACETIC ACID

LONDON Home demand has been maintained for most of the routine industrial chemicals and there has been little change in the overall position. Export trade inquiries have covered a wide range of chemical products. The price of acetic acid has been reduced as from 1 November with a revision of the basis of calculating prices. The reduction is about 7½% for all grades and the new quotations are given in the current price list (see p. 783).

Among the agricultural chemicals, there has been a steady demand for basic slag while activities in the coal tar products continues brisk.

MANCHESTER Quotations generally have been well maintained and few changes have occurred. A fair weight of new business has been placed on both home and overseas accounts. On the home side the textile and allied trades and other leading industrial outlets are mostly calling for good deliveries against existing commitments, and the movement of dyestuffs, plastics materials, and a number of other lines to export markets leaves little ground for complaint. There is a continued steady demand for creosote oil, cresylic acid, and the naphthalenes.

SCOTLAND Buying has been quite brisk during the past week and overall a fair range of industrial chemicals have been demanded. Quantities have again been well maintained with emphasis on the delivery position. Enquiries too have been numerous and interest is beginning to be shown in regard to contracts. The position in regard to agricultural chemicals is still seasonably quiet, on the other hand business in the overseas market has been active. Prices on the whole have shown little change.

BRITISH CHEMICAL PRICES

GENERAL CHEMICALS

Acetic Acid. 10-ton quantities, 80% tech. in bulk, £77 per ton; in casks, £90 per ton; 80% pure in bulk, £83; in casks, £94; glacial, 98/100% in bulk, £93; in drums, £100.

Acetic Anhydride. Ton lots d/d, £128.

Alum. Ground, f.o.r., about £25.
MANCHESTER: Ground, £25.

Aluminium Sulphate. Ex-works, d/d, £15 10s to £18.
MANCHESTER: £16 to £18.

Ammonia, Anhydrous. Per lb., 1s 9d-2s 3d.

Ammonium Chloride. Per ton lot, in non-ret. pack, £33 2s 6d.

Ammonium Nitrate. D/d, 4-ton lots, £37 10s.

Ammonium Persulphate. Per cwt., in 1-cwt. lots, d/d, £6 13s 6d; per ton, in min. 1-ton lots, d/d, £123 10s.

Ammonium Phosphate. MAP., £106 per ton; DAP, £100 10s., per ton, d/d.

Antimony Sulphide. Per lb., d/d UK in min. 1-ton lots; crimson, 5s 6d d/d to 6s; golden, 3s 9d d/d per lb. to 5s 2d d/d.

Arsenic. Ex-store, £45 to £50.

Barium Carbonate. Precip., d/d, 4-ton lots or more, bag packing, £41 per ton.

Barium Chloride. 2-ton lots, £45.

Barium Sulphate [Dry Blanc Fixe]. Precip. 2-ton lots, d/d, £39.

Bleaching Powder. Ret. casks, c.p. station, in 4-ton lots. £30 7s 6d.

Borax. Ton lots, in hessian sacks, c.p. Tech. anhydrous, £70; gran., £47; crystal, £50 10s; powder, £51 10s; extra fine powder, £52 10s; BP, gran., £56; crystal, £59 10s; powder, £60 10s; extra fine powder, £61 10s. Most grades in 6-ply paper bags, £1 less.

Boric Acid. Ton lots, in hessian sacks, c.p. Comm., gran., £78; crystal, £87; powder, £84 10s; extra fine powder, £86 10s; BP gran., £91; crystal, £99; powder, £96 10s; extra fine powder, £98 10s. Most grades in 6-ply paper bags, £1 less.

Calcium Chloride. Ton lots, in non-ret. pack; solid and flake, about £15.

Chlorine, Liquid. In ret. 16-17 cwt. drums d/d in 3-drum lots, £41.

Chromic Acid. Less 2½%, d/d UK, in 1-ton lots, per lb., 2s 2¼d.

Chromium Sulphate, Basic. Crystals, d/d, per lb., 8½d; per ton, £79 6s 8d.

Citric Acid—Granular. In kegs, 1-4 cwt. lots, per cwt., £11; 5-19 cwt. lots, per cwt., £10 16s; 1-ton lots, per cwt., £10 15s; packed in paper bags, 1-4 cwt. lots, per cwt., £10 12s; 5-19 cwt. lots, per cwt., £10 8s; 1-ton lots, per cwt., £10 7s.

Cobalt Oxide. Black, per lb., d/d, bulk quantities, 13s 2d.

Copper Carbonate. Per lb., 3s 6d.

Copper Sulphate. £75 per ton less 2% f.o.b. Liverpool.

Cream of Tartar. 100%, per cwt., about £11 12s.

Formaldehyde. In casks, d/d, £40.

Formic Acid. 85%, in 4-ton lots, c.p., £91.

Glycerine. Chem. pure, double distilled 1.2627 s.g., per cwt., in 5-cwt. drums for annual purchases of over 5-ton lots and under 25 tons, £12 1s 6d. Refined technical grade industrial, 5s per cwt. less than chem. pure.

Hydrochloric Acid. Spot, per carboy, d/d (according to purity, strength and locality), about 12s.

Hydrofluoric Acid. 60%, per lb., about 1s 2d.

Hydrogen Peroxide. Carboys extra and ret. 27.5% wt., £115; 35% wt., d/d, £138.

These prices are checked with the manufacturers, but in many cases there are variations according to quality, quantity, place of delivery, etc. Abbreviations: d/d, delivered; c.p., carriage paid; ret., returnable; non-ret. pack., non-returnable packaging; tech., technical; comm., commercial; gran., granular.

All prices per ton unless otherwise stated

Iodine. Resublimed BP, under 1 cwt., per lb., 11s 6d; for 1-cwt. lots, per lb., 11s 3d.

Iodoform. Under 1 cwt., per lb., 24s 1d; for 1-cwt. lots, per lb., 23s.; crystals, 3s more.

Lactic Acid. C.P., d/d, 44% by wt., per lb., 13d; 50% by wt., 14½d; 80% by wt., 23d; dark tech., ex-works, 44% by wt., per lb., 9d; 1-ton lots, ex-works, usual container terms.

Lead Acetate. White, about £154.

Lead Nitrate. 1-ton lots, about £135.

Lead, Red. Basic prices: 15-cwt. drum lots, Genuine dry red, £104 5s per ton; orange lead, £112 5s per ton; Ground in oil: red, £122 5s, orange, £135 5s.

Lead, White, Basic prices: in 5-cwt. drums, per ton for 2 ton lots, Dry English £115 5s; Ground in oil, £134 5s.

Lime Acetate. Brown, ton lots, d/d, £40; grey, 80-82%, ton lots, d/d, £45.

Litharge. In 5-cwt. drum lots, £116 5s per ton.

Magnesite. Calcined, in bags, ex-works, about £21.

Magnesium Carbonate. Light, comm., d/d, 2-ton lots, £84 10s under 2 tons, £97.

Magnesium Chloride. Solid (ex-wharf), £17 10s.

Magnesium Oxide. Light, comm., d/d, under 1-ton lots, £245.

Magnesium Sulphate. Crystals, £16.

Mercuric Chloride. Tech. powder, per lb., for 1-ton lots, 20s; 5-cwt. lots, in 28-lb. parcels, 20s 6d; 1-cwt. lots, 20s 9d.

Mercury Sulphide, Red. 5-cwt. lots in 28-lb. parcels, per lb., £1 10s 6d; 1-cwt. lots, £1 11s.

Nickel Sulphate. D/d, buyers UK, nominal, £170.

Nitric Acid. 80° Tw., £35 2s.

Oxalic Acid. Home manufacture, min. 4-ton lots, in 56 lb. paper bags, c.p., about £125-£130.

Phosphoric Acid. TPA 1,700, ton lots, c.p., £103; BP (s.g. 1,750), ½-ton lots, c.p., per lb., 1s 4d.

Potash, Caustic. Solid, 1-ton lots, £95 10s; liquid, £36 15s.

Potassium Carbonate. Calcined, 96/98%, 1-ton lots, ex-store, about £76.

Potassium Chloride. Industrial, 96%, 1-ton lots, about £24.

Potassium Dichromate. Gran., per lb., in 5-cwt. to 1-ton lots, d/d UK, 1s 2½d.

Potassium Iodide. BP, under 1 cwt, per lb., 9s 0d., per lb for 1-cwt lots, 8s 9d.

Potassium Nitrate. 4-ton lots, in non-ret. pack, c.p., £63 10s.

Potassium Permanganate. BP, 1-cwt. lots, per lb., 1s 11¾d; 3-cwt. lots, per lb., 1s 11¼d; 5-cwt. lots, per lb., 1s 10¾d; 1-ton lots, per lb., 1s 10½d; 5-ton lots, per lb., 1s 10d. Tech., 1-ton lots in 1-cwt. drums, per cwt., £9 18s; 5-cwt. in 1-cwt. drums, per cwt., £10; 1-cwt. lots, £10 9s.

Salammoniac. Ton lot, in non-ret. pack, £47 10s.

Salicylic Acid. MANCHESTER: Tech., d/d, per lb., 2s 6d, cwt. lots.

Soda Ash. 58% ex-depot or d/d, London station, 1-ton lots, about £16 11s 6d.

Sodium Acetate. Comm. crystals, d/d, £75 8s.

Soda, Caustic. Solid 76/77%; spot, d/d 1-ton lots, £33 16s 6d.

Sodium Bicarbonate. Ton lot, in non-ret. pack, £12 10s.

Sodium Bisulphite. Powder, 60/62%, d/d 2-ton lots for home trade, £46 2s 6d.

Sodium Carbonate Monohydrate. Ton lot, in non-ret. pack, c.p., £64.

Sodium Chlorate. 1-cwt. drums, c.p. station, in 4-ton lots, about £80 per ton.

Sodium Cyanide. 96/98%, ton lot in 1-cwt. drums, £126.

Sodium Dichromate. Gran. Crystals per lb., 1s. Net d/d UK, anhydrous, per lb., 1s 1¾d. Net del. d/d UK, 5-cwt. to 1-ton lots.

Sodium Fluoride. D/d, 1-ton lots and over, per cwt., £5; 1-cwt. lots, per cwt., £5 10s.

Sodium Hyposulphite. Pea crystals, £38; comm., 1-ton lots, c.p., £34 15s.

Sodium Iodide. BP, under 56 lb. per lb., 11s 3d; 56 lb. and over, 11s 0d.

Sodium Metaphosphate [Calgon]. Flaked, paper sacks, £136.

Sodium Metasilicate. (Spot prices) D/d UK in 1-ton lots, 1-cwt. free paper bags, £29.

Sodium Nitrate. Chilean refined gran. over 98%, 6-ton lots, d/d c.p., per ton, £29.

Sodium Nitrite. 4-ton lots, £32.

Sodium Perborate. (10% available oxygen) in 1-cwt. free kegs, 1-ton lots, £129 10s; in 1-cwt. lots, £139 5s.

Sodium Percarbonate. 12½% available oxygen, in 1-cwt. kegs, £170 15s.

Sodium Phosphate. D/d, ton lots: di-sodium, crystalline, £40 10s, anhydrous, £89; tri-sodium, crystalline, £39 10s, anhydrous, £87.

Sodium Silicate. (Spot prices) 75-84° Tw. Lancs and Ches., 6-ton lots, d/d station in loaned drums, £12 10s; Dorset, Somerset and Devon, per ton extra, £3 5s; Scotland and S. Wales, extra, £2 17s 6d. Elsewhere in England, not Cornwall, extra, £1.

Sodium Sulphate [Desiccated Glauber's Salt]. D/d in bags, about £19.

Sodium Sulphate [Glauber's Salt]. D/d, up to £14.

Sodium Sulphate [Salt Cake]. Unground, d/d station in bulk, £10.
MANCHESTER: d/d station, £10 10s.

Sodium Sulphide. Solid, 60/62%, spot, d/d, in drums in 1-ton lots, £36 2s 6d; broken, d/d, in drums in 1-ton lots, £37 2s 6d.

Sodium Sulphite. Anhydrous, £71 10s; comm., d/d station in bags, £27-£28 10s.

Sulphur. 4 tons or more, ground, according to fineness, £20-£22.

Sulphuric Acid. Net, naked at works, 168° Tw. according to quality, £9 15s.—£11 7s 6d per ton; 140° Tw., arsenic free, £8 2s 6d; 140° Tw., arsenious, £7 17s 6d.

Tartaric Acid—Powder and Granular. Per cwt.: 10 cwt. or more, in kegs, 300s; in bags, 292s per cwt.

Titanium Oxide. Standard grade comm., rutile structure, £178; standard grade comm., anatase structure, £163.

Zinc Oxide. Per ton: white seal, £107 10s; green seal, £105 10s; red seal, £102 10s

SOLVENTS AND PLASTICISERS

Acetone. All d/d. In 5-gal. drums, £124; in 10-gal. drums, £114; in 40-45 gal. drums, under 1 ton, £89; 1-5 tons, £84; 5-10 tons, £82; 10 tons and up, £80; in 500-gal. tank wagons, £79. In bulk minimum 2,500 gal. £75 per ton.

Butyl Acetate BSS. 10-ton lots, £165.

n-**Butyl Alcohol BSS.** 10 tons, in drums, d/d, £137 10s.
sec-**Butyl Alcohol.** All d/d. In 5-gal. drums, £168; in 10-gal. drums, £158; in 40-45 gal. drums, under 1 ton, £133; 1-5 tons £130; 5-10 tons, £129; 10 tons and up, £128; in 400-gal. tank wagons, £125.
tert-**Butyl Alcohol.** 5-gal. drums, £195 10s; 40/45-gal. drums: 1 ton, £175 10s; 1-5 tons, £174 10s; 5-10 tons, £173 10s; 10 tons and up, £172 10s.
Diacetone Alcohol. Small lots: 5-gal. drums, £185; 10-gal. drums, £175. 40/45-gal. drums: under 1 ton, £148; 1-5 tons, £147; 5-10 tons, £146; 10 tons and over, £145, in 400-gal. tank wagons, £142.
Dibutyl Phthalate. In drums, 10 tons, d/d per ton, £203; 45-gal. 1-4 drums, £209.
Diethyl Phthalate. In drums, 10 tons, per ton, £187 10s; 45-gal. 1-4 drums, £193 10s.
Dimethyl Phthalate. In drums, 10 tons, per ton, d/d, £179; 45-gal. 1-4 drums, £185.
Dioctyl Phthalate. In drums, 10 tons, d/d, per ton, £276; 45-gal. 1-4 drums, £282.
Ether BSS. 1-ton lots, drums extra, per lb., 1s 11d.
Ethyl Acetate. 10-ton lots, d/d, £137.
Ethyl Alcohol Fermentation grade (PBF 66 o.p.). Over 300,000 p. gal., 3s 10½d; d/d in tankers, 2,500- 10,000 p. gal. per p. gal., 4s 0½d. D/d in 40/45-gal. drums, p.p.g. extra, 2d.
Absolute alcohol (74.5 o.p.), p.p.g. extra, 2d.
Methanol. Pure synthetic, d/d, £40.
Methylated Spirit. Industrial 66° o.p.: 500-gal. and up, d/d in tankers, per gal., 5s 7½d; 100-499 gal. in drums, d/d per gal., 6s 0½d-6s 2½d. Pyridinised 66° o.p.: 500 gal. and up, in tankers, d/d, per gal., 5s 11d; 100-499 gal. in drums, d/d, per gal., 6s 4d-6s 6d.
Methyl Ethyl Ketone. All d/d. in 40/45-gal. drums, under 1 ton, £143 10s; 1-5 tons, £138 10s; 5-10 tons, £136 10s; 10 tons and up, £143; in 400-gal. tank wagons, £134 10s.
Methyl *iso*Butyl Carbinol. All d/d. In 5-gal. drums, £203; in 10-gal. drums, £193; 40-45 gal. drums, less than 1 ton, £168; 1-9 tons, £165; 10 tons and over, £163; in 400-gal. tank wagons, £160.
Methyl *iso*Butyl Ketone. All d/d. In 5-gal. drums, £209; in 10-gal. drums, £199; in 40/45-gal. drums, under 1 ton, £174; 1-5 tons, £171; 5-10 tons, £170; 10 tons and up, £169; in 400-gal. tank wagons, £166.
***iso*Propyl Acetate.** 10 tons, d/d, 45-gal. drums £132.
***iso*Propyl Alcohol.** Small lots: 5-gal. drums, £118; 10-gal. drums, £108; 40/45-gal. drums: less than 1 ton, £83; 1-9 tons, £81; 10-50 tons, £80 10s; 50 tons and up, £80.

RUBBER CHEMICALS

Carbon Disulphide. According to quality, £61-£67.
Carbon Black. GPF: Ex-store, Swansea. Min. 3-ton lots, one delivery, 6¼d per lb.; min. 1-ton lots and up to 3-tons, one delivery, 7d. per lb.; ex-store, Manchester, London and Glasgow, 7¼d per lb. HAF: ex-store, Swansea; Min. 3-ton lots, one delivery, 7¼d per lb.; min. 1-ton lots and up to 3-tons, one delivery, 8d per lb. Ex-store Manchester, London and Glasgow, 8¼d per lb. ISAF: Min. 3-ton lots in one delivery, 9¼d per lb., min. 1-ton lots and up to 3-tons in one delivery, 10d per lb. Ex-store Swansea, Ex-store Manchester, London and Glasgow, 10¼d per lb.
Carbon Tetrachloride. Ton lots, £83 15s.
India-Rubber Substitutes. White, per lb., 1s 4¼d to 1s 7d; dark, d/d, per lb., 1s 0¼d to 1s 4d.
Lithopone. 30%, about £57 10s for 5-ton lots.
Mineral Black. £7 10s-£10.
Sulphur Chloride. British, about £50.
Vegetable Lamp Black. 2-ton lots, £64 8s.
Vermilion. Pale or deep, 7-lb. lots, per lb., 15s 6d.

COAL TAR PRODUCTS

Benzole. Per gal., min. 200 gal., d/d in bulk, 90's, 5s 3d; pure, 5s 7d.
Carbolic Acid. Crystals, min. price, d/d bulk, per lb., 1s 4¼d; 40/50-gal. ret. drums extra, per lb., ¼d.
Creosote. Home trade, per gal., according to quality, f.o.r. maker's works, 1s-1s 9d. MANCHESTER: Per gal., 1s 3d-1s 8d.
Cresylic Acid. Pale 99/100%, per gal., 7s. D/d UK in bulk: Pale ADF, per imperial gallon f.o.b. UK, 8s; per US gallon, c.i.f. NY, 103.50 cents freight equalised.
Naphtha. Solvent, 90/160°, per gal., 5s 3d. heavy, 90/190°, for bulk 1,000-gal. lots, d/d, per gal., 4s 1d. Drums extra; higher prices for smaller lots.
Naphthalene. Crude, 4-ton lots, in buyers' bags, nominal, according to m.p.: £22-£30; hot pressed, bulk, ex-works, £40; refined crystals, d/d min. 4-ton lots, £65-£68.
Pitch. Medium, soft, home trade, f.o.r. suppliers' works, £10 10s; export trade, f.o.b. suppliers' port, about £12.
Pyridine. 90/160, per gal., 16s 6d about.
Toluol. Pure, per gal., 5s 9d; 90's, d/d, 2,000 gal. in bulk, per gal., 5s 1d. MANCHESTER: Pure, naked, per gal., 5s 6d.
Xylole. According to grade, in 1,000-gal. lots, d/d London area in bulk, per gal., 5s 7½d-5s 8½d.

INTERMEDIATES AND DYES
(Prices Normal)

m-**Cresol** 98/100%. 10 cwt. lots d/d, per lb., 4s 9d.
o-**Cresol** 30/31°C. D/d, per lb., 1s.
p-**Cresol** 34/35°C. 10 cwt. lots d/d, per lb., 5s.
Dichloraniline. Per lb., 4s 6d.
Dinitrobenzene. 88/99°C., per lb., 2s 1d.
Dinitrotoluene. Drums extra. SP 15°C., per lb., 2s 1½d; SP 26°C., per lb., 1s 5d; SP 33°C., per lb., 1s 2½d; SP 66/68°C., per lb., 2s 1d.
p-**Nitraniline.** Per lb., 5s 1d.
Nitrobenzene. Spot, 90 gal. drums (drums extra), 1-ton lots, d/d, per lb., 10d.
Nitronaphthalene. Per lb., 2s 5½d.
o-**Toluidine.** 8-10 cwt. drums (drums extra), per lb., 1s 11d.
p-**Toluidine.** In casks, per lb., 6s 1d.
Dimethylaniline. Drums extra, c.p., per lb., 3s 2d.

Imported Borax, Duty

ASKED in the House of Commons what recent applications he has received for the abolition or reduction of the duty on imported borax, the President of the Board of Trade, Mr. R. Maudling, replied that it had been announced in January that the B.o.T. had applications for the removal of duty on refined borax under consideration. Their decision would be announced very shortly.

TRADE NOTES

B.D.H. Chemicals

Additions to the B.D.H. range of chemicals for October are: tetrahydroxy-*p*-benzoquinone disodium salt, a compound which gives a red precipitate with barium ions and can be used as both an internal and external indicator; L-3-(4:4-dihydroxy - phenyl) - alanine, an amino acid; 2-thenoyl-trifluoro-acetone, a reagent which forms chelates with many metallic cations; and dioxan special for spectroscopy. Also included are notes on assay methods for serum enzymes, and the Milk (Special Designation) Regulations 1960.

Schenectady-Midland Resins

Schenectady-Midland Ltd., Oldbury, Birmingham, a company which was formed earlier in the year, has available a number of publications. These are: resins for emulsion polishes; resins for rubber compounding and rubber-based adhesives; resins for the brake lining industry; and wire enamels and insulating varnishes for the electrical industry.

Hycar Rubber Story

'The Hycar Rubber Story', a new booklet from British Geon Ltd., shows how these butadiene/acrylonitrile rubbers are making more things possible in many different fields. After an introductory section describing the manufacture and processing of Hycar, the booklet shows how its special properties meet the needs of nine different industries. Copies may be obtained free from British Geon's information department at Devonshire House, Piccadilly, London W.1.

D.C.L. Cut Acetic Acid Prices

Chemical Division of the Distillers Co. Ltd., has reduced the selling price of all grades of acetic acid, effective from 1 November. Selling prices are now based exclusively on the size of delivery and the present basis of calculating prices on contract quantities will be abolished. The revised prices will give an overall reduction of about 7½% for all grades.

Monsanto Price Cuts

Monsanto have announced price reductions for the three grades—standard, fire-retardant, and oil- and petrol-resistant—of their Montopore expandable polystyrene beads. The reductions vary according to quantity ordered; e.g. for 100 tons of Montopore P—standard grade—has been reduced from 3s 7d per lb. to 3s 3½d and the price of Montopore S—fire-retardant grade—has fallen from 4s 1d per lb. to 3s 8½d per lb.

Plywood Containers

The container department of Venesta Plywood Ltd. has opened a new sales office at Crabtree Lane, Clayton, Manchester 11. It will be complementary to the department's existing sales offices in London and Erith, Kent, and will be equipped to answer enquiries regarding Venesta plywood cases and barrels and fibre drums.

NEW PATENTS

By permission of the Controller, H.M. Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

AMENDED SPECIFICATIONS

On Sale 30 November

Organo-aluminium compounds. Bergwerksgesellschaft Hibernia AG. **822 484**

On Sale 7 December

Preparation of urea. Stamicarbon N.V. **739 876**

ACCEPTANCES

Open to public inspection 7 December

Mono-azo-dyestuffs containing dihalotrazine residues, their manufacture and use. Ciba Ltd. **855 792**

Polyacrylonitrile solutions. Courtaulds Ltd. [Addition to 796 294.] **855 767**

Sulphonation of organic liquids. Shell Research Ltd. **855 774**

N-substituted anilides and their preparation. American Cyanamid Co. **855 770**

Method of purifying nicotinic acid. Lonza Electric & Chemical Works Ltd. **855 819**

Vulcanisation of foamed rubber. Leda Chemicals Ltd. **855 844**

Analysis of liquids. Technicon International Ltd **855 555**

Cyanine dyes and silver halide emulsions sensitised therewith. Agfa AG. **855 686**

Synthetic tanning agents. Farbenfabriken Bayer AG. **855 572**

Acetanilide derivatives. Boots Pure Drug Co. Ltd. **855 556**

Dinitro-butyl-phenol esters and their use in pesticidal preparations. Farbwerke Hoechst AG Vorm. Meister, Lucius & Brüning. **855 736**

Liquid detergent compositions. Unilever Ltd. **855 679**

Production of butadiene and dichlorobutenes. Distillers Co. Ltd. **855 559**

Stabilised halogen-containing synthetic resins. Metal & Thermit Corp. **855 740**

Polyacrylamide derivatives. British Nylon Spinners Ltd. **855 741**

Water-insoluble monoazo dyestuffs containing halohydrin groups. Imperial Chemical Industries Ltd. **855 715**

Method of recovering sulphenamides from solution in organic solvents. American Cyanamid Co. **855 717**

Plastic compositions. Union Carbide Corp. **855 748**

Catalysts for condensation reactions. Goodyear Tire & Rubber Co. **855 694**

Processes for the removal of water from aqueous liquors. Makhsavei Israel. **855 530**

Preparation of cyclopentane dicarboxylic acids. Esso Research & Engineering Co. **855 564**

Preparation of 1-chloro-3-methylbutene-2. Metal & Thermit Corp. **855 696**

Omega-alkymercuriethio fatty acids, derivatives thereof and process for their preparation. Fujisawa Pharmaceutical Co. Ltd. **855 699**

Process for the production of polymers of acrolein or α-alkyl acroleins. Deutsche Gold- Und Silber-Scheideanstalt Vorm. Roessler. **855 888**

Process for the production of macromolecular poly-acroleins. Deutsche Gold- Und Silber-Scheideanstalt Vorm. Roessler. **855 889**

Process for the production of 4-nitro-diarylamines. Farbenfabriken Bayer AG. **855 719**

Cyanoalkyl-polysiloxanes and their production. Union Carbide Corp. [Divided out of 847 803.] **855 703**

Process for producing microspheroidal silica-alumina catalyst. American Cyanamid Co. **855 704**

Method of making orientated graft polymer structures containing polymerised olefins. Dow Chemical Co. **855 720**

Production of 1,3,4-oxdiazoles. Badische Anilin- & Soda-Fabrik AG. **855 721**

Process for the preparation of aromatic dicarboxylic acids. Bataafse Petroleum Maatschappij N.V. **855 751**

Preparation of polymerisation catalysts. Continental Oil Co. **855 757**

Recovery of isoprene by fractionation and extractive distillation. Esso Research & Engineering Co. **855 760**

Ethylene-α-butene copolymers. Union Carbide Corp. **855 761**

Preparation of Vitamin A acetate. Nopco Chemical Co. **855 519**

Liquid detergent compositions. Unilever Ltd. [Divided out of 855 679.] **855 893**

Oxidation catalyst and method for the preparation thereof. Union Chimique Belge S.A. **855 762**

Melamine-formaldehyde polyvinyl alcohol resin and process of preparing same. American Cyanamid Co. **855 536**

Method of product control in aqueous suspension polymerisations of alkenyl aromatic compounds. Dow Chemical Co. **855 522**

Process and apparatus for the thermal treatment of hydrocarbons. Soc. Belge de l'Azote et des Produits Chimiques du Marly. **855 523**

Autothermal cracking of hydrocarbons to cracked gas rich in olefins. Badische Anilin- & Soda-Fabrik AG. **855 903**

Preparation of the higher-melting form of α-ethyl-crontonoyl urea. Farbenfabriken Bayer AG. **855 528**

Process of preparing diakyl substituted aromatic compounds. Universal Oil Products Co. **855 894**

Open to public inspection 14 December

Recovery of nickel from sulphide ores. International Nickel Co. of Canada Ltd. **856 425**

Manufacture of inorganic pigments. Brown Ltd., J. M. **856 428**

Production of silicon. General Electric Co. **856 137**

Conversion of metal oxides to chlorides. United Kingdom Atomic Energy Authority. **856 462**

Insecticides comprising halogenated-endomethylene-tetrahydrophthalans. Ruhrchemie AG. **855 955**

Liquid-liquid extraction columns. United Kingdom Atomic Energy Authority. **855 963**

Lipo-polysaccharides of bacterial origin and process for preparing same. Ciba Ltd. **856 413**

Anti-allergic and anti-viral substances preparing from bacterial cultures. Ciba Ltd. **856 414**

Substituted anilides. Smith, A. E. W. **856 385**

Sulphonated urea-thiourea formaldehyde resins. American Cyanamid Co. **856 466**

Process for the production of valuable gaseous hydrocarbons. Koppers GmbH., H. [Addition to 787 829.] **856 418**

Foam inhibition in the processing of hydrocarbons. Polymer Corporation Ltd. **856 050**

Method of making hydrogen peroxide. Columbia-Southern Chemical Corporation. **856 420**

Method for preparing sulphenamides. Goodyear Tire & Rubber Co. **856 421**

Polymerisation of fluorine-substituted vinyl-type compounds. Minnesota Mining & Manufacturing Co. **856 469**

Method for polymerising propylene, butadiene, isoprene and chloroprene. National Lead Co. **856 434**

Water-insoluble monoazo dyestuffs containing carboxylic ester groups. Westminster Bank Ltd. [Addition to 819 664.] **856 348**

Synthetic polymers. British Nylon Spinners Ltd. **856 388**

Process for drying olefin polymers. Phillips Petroleum Co. **856 326**

Electro chemical process for the manufacture of *p*-aminophenol. Miles Laboratories Inc. **856 436**

Manufacture of coated polymeric substrates. Du Pont de Nemours & Co., E. I. [Addition to 801 531.] **856 329**

Process for conducting chemical reactions. Foo Machinery & Chemical Corporation. **856 331**

Production of cellular materials. Imperial Chemical Industries Ltd. **855 933**

Production of anhydrous boron phosphate. United States Borax & Chemical Corporation. **856 332**

Production of boron carbon compounds. United States Borax & Chemical Corporation. **856 304**

Production of cyclic carboxylic acids. Imperial Chemical Industries Ltd. **856 245**

Oil-modified alkyd resins. Imperial Chemical Industries Ltd. **856 307**

Oil-soluble compositions containing organic barium salts. Lubrizol Corporation. **856 390**

Polysulphonamides. Imperial Chemical Industries Ltd. **856 310**

Aniline derivatives. Merck & Co. Inc. **856 443**

Process of separating an azeotropic mixture. American Oil Co. **856 371**

Derivatives of isocyanuric acid. Imperial Chemical Industries Ltd. **856 372**

Substituted acid amides and bituminous bonding compositions containing them. Carlisle Chemical Works Inc. **856 373**

Halogenated tetrahydro-thiophene-1, 1-dioxides. Diamond Alkali Co. **856 446**

Detergent composition. United Kingdom Atomic Energy Authority. [Addition to 763 547.] **856 377**

Methine or polymethine dyes and their uses. Ilford Ltd. **856 068**

DIARY DATES

MONDAY 7 NOVEMBER

Brit. Weed Control Cncl.—Brighton: 'Fifth British Weed Control Conference until 10 November.

C.S.—Cambridge: Univ. Chemical Lab., Lensfield Rd., 5 p.m. 'Researches on alkaloid biosynthesis', by Dr. A. R. Battersby.

C.S.—Oxford: Inorganic Chem. Lecture Theatre, 8.15 p.m. 'Magnetic resonance in MnF_2', by Prof. B. Bleaney.

Plastics Inst.—Leicester: Grand Hotel, 6.45 p.m. 'Contribution of plastics to man-made fibres industry', by A. Beecham.

R.I.C.—London: Woolwich Polytechnic, Thomas St., S.E.18, 6.45 p.m. 'Some aspects of chemistry of cancer', by Dr. W. Davis.

TUESDAY 8 NOVEMBER

I.Chem.E.—London: Burlington Hse., W.1, 5.30 p.m. 'Dynamic response of a distillation column to changes in the rublux and vapour flow rates', and 'An introduction to theoretical evaluation of frequency response of a distillation column to a change of reflux rate', by R. N. Wood & W. D. Armstrong.

R.I.C.—London: Norwood Technical Coll., Knight's Hill, S.E.27, 6.30 p.m. Film show.

S.C.I. with C.S. & R.I.C.—Aberdeen: Robert Gordon's Tech. Coll. 'Some current research interest in Dept. of Chemistry, Birmingham Univ.', by Prof. J. C. Robb.

S.C.I.—Birmingham: Birmingham & Midland Inst., 6.30 p.m. 'Some recent work on soaps and detergents', by Dr. A. S. C. Lawrence.

S.C.I. with C.S. & R.I.C.—Belfast: Chemistry Dept., Queen's Univ., 7.45 p.m. 'Adsorption & catalysis on semi-conducting oxides', by Dr. F. T. Stone.

WEDNESDAY 9 NOVEMBER

R.I.C.—London: R.I., 21 Albemarle St., W.1, 5.45 p.m. Presentation of Meldola Medals by E. Le Q. Herbert.

S.C.I.—London: 14 Belgrave Sq., S.W.1, 6.15 p.m. 'Food technology in Italy'.

THURSDAY 10 NOVEMBER

C.S.—London: Burlington Hse., W.1, 7.30 p.m. 'Electron configuration and structure of transition-metal complexes', by Prof. R. S. Nyholm.

O.C.C.A.—London: Manson Hse., 26 Portland Pl., W.1, 7 p.m. 'Water-thinanble stoving finishes', by A. G. North.

R.I.C.—Croydon: Tech. Coll., 7 p.m. 'Some aspects of chemotherapy', by Dr. H. J. Barber.

S.A.C.—Birmingham: Coll. of Tech., Gosta Green, 6.30 p.m. 'Analytical problems in forensic toxicology', by F. L. Cann.

FRIDAY 11 NOVEMBER

C.S.—Birmingham: Chemistry Dept., University, 4.30 p.m. 'Recent advances in chemistry of Vitamin D', by Prof. B. Lythgoe.

C.S.—Cambridge: Univ. Chemical Lab., Lensfield Rd., 8.30 p.m. 'Big rings', by Prof. R. A. Raphael.

C.S.—Dublin: Trinity Coll., 7.45 p.m. 'The gibberellins', by Dr. B. E. Cross.

C.S.—St. Andrews: Chem. Dept., Univ., 5.15 p.m. 'Free radicals containing oxygen', by Dr. P. Gray.

O.C.C.A.—Liverpool: Constitutional Club, Tithelram St., 6.30 p.m. 'Acrylic emulsion paints', by R. Kershaw.

S.C.I.—Exeter: Univ., 5 p.m. 'The scientific organisation of chemical inspection', by E. W. S. Press.

S.C.I.—Leeds: Houldsworth School of Applied Science, Univ., 7 p.m. Hodsman memorial lecture by G. Dougill.

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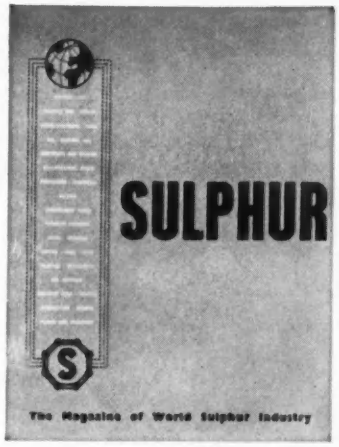

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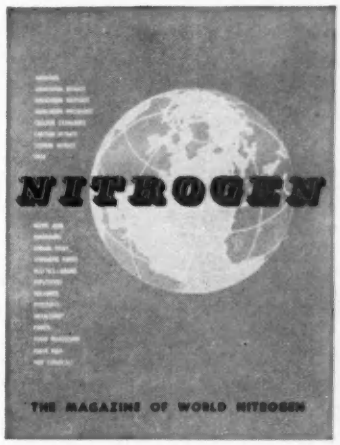

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